The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Fate of the Act

So the Dyestuffs (Import Regulation) Act, according to the Government decision announced in the House of Commons on Wednesday, is to lapse on January 14. This decision, one of the most vital in relation to chemistry and science in general made in recent years and delayed almost to the eleventh hour, was disclosed in the most casual manner in reply to a member's question. Mr. Graham curtly disposed of the matter by saying that the object of the Act appeared to have been realised, and that there was no further need for its continuance. The future of the dyestuffs industry, whether it survives against a renewed flood of German and other foreign competition, the effect on the maintenance of research staffs, whether they can be kept together or may have to be dispersed, the effect on the works which have been brought into existence, and which employ large numbers of workmen, besides trained chemists and engineers—these appear to be matters of no concern to the Government. The cheerfulness with which they have decided to terminate the modified protection that the dyestuffs industry has enjoyed for ten years, with astonishingly good results, is remarkable when one remembers that the Government themselves, resting as they do on trade union support and interests, represent the most intensive and ruthless form of protection the country has ever experienced.

Who will benefit from this decision? The users of dyestuffs, whose industry was saved from ruin by the Act and the splendid work done under it by British chemists and organisers, may have a slight advantage in prices and in the range of selection, and being now safe against the dangers that threatened them when war cut off their supplies and they frantically demanded assured home supplies at whatever cost for the future, may now quietly forget their obligations to their rescuers. How much they will really be better off in price will be shown by the amount of financial benefit that will be passed on to their customers. We suspect it will be slight. Secondly, the importers will welcome—and quite consistently from their own point of view—the return to free imports, though even they may find their old field restricted by the producers' policy of acting as their own marketers and cutting out the middle man. Lastly, and chiefly, the people who will benefit will be foreign competitive producers of dyes. The great German combination has already its organised centres of distribution in this country, and now that the Government are putting it once more on equal terms, may be expected to spare no effort to recapture the British market. In German boardrooms and laboratories there should be profound gratitude to our Government.

Who, on the other hand, will suffer if the newly-established British industry is damaged? First of all, the workers who are employed in British works producing British dyes, but who will derive no advantage from the increased prosperity of corresponding German works. Secondly, the manufacturing firms who have sunk an enormous amount of capital and effort in plant, buildings, staff and research in order to achieve the remarkable results of the last ten years. To produce one new colour on a commercial basis involves an amount of preliminary research and later experimental work that few outside the industry appreciate, and it is a fair claim that those who have incurred this initial expense should be allowed a reasonable period in which to recoup themselves. But the interest that will ultimately suffer most is one of vital national importance—that is, the interest of scientific research. That explains the concern with which scientific leaders of no politics and of every shade of politics have viewed the situation and expressed their opinions. The dyestuffs industry, perhaps more than any other is the nursery of chemical research, and the nursery cannot exist without the industry to which it is attached. If the scientific resources of this country, as our best authorities fear they will be, are seriously damaged, the Government will have inflicted one of the worst blows it could have administered.

The users, to do them justice, have strongly urged the importance of an efficient home industry; their

complaint has been that it was unfair for the whole sacrifice to be put on them alone. The Government have used one side of the users' argument, but have discreetly overlooked the other. Months ago Sir Sutcliffe Smith appealed to all interests concerned to decide on some agreed scheme that could be put before the Government. Had that been done, the Government would have found it difficult to reject united proposals. It was an opportunity for the missing of which all parties may have to pay the penalty.

Blue Visions

WE live in a chromatic world, all around us is colour—of sunrise and sunset; of the sky and the sea, an azure blue; of the land, mineral reds and browns; of the green trees, chlorophyll; of the flowers, red and blue and yellow anthocyans and flavones; of man's handicraft displayed by woman, aniline dyes; of feathers and insects, so-called structural colours.

Many of these colours are pigments, mineral or organic, natural or synthetic; some fast, some ephemeral; some old as history, many discovered but yesterday. Others are but visions due to the scattering of light. Bancroft, the bard of Cornell, has written in physico-chemical metre, yet most entrancingly, of blue eyes and blue feathers and shown how blue light incident on the feathers of a bird is scattered by the disperse system consisting of minute air cells in the horny structure of the feathers, so that the Tyndall blue is produced, so characteristic of turbid media. For not a grain of pigment can be extracted, however much all the arts and devices of the chemist be exercised, from the brilliant feathers of the jay, the kingfisher, or the indigo bunting.

The other afternoon Lord Rayleigh discoursed to the Royal Society on the iridescent colours of birds and insects which he had submitted to prolonged exposures to ultra-violet light or to moist chlorine vapour, both actions likely to call on his head a visit from an inspector of the "S.P.C. to coloured objects." In certain cases, *e.g.*, feathers of parrots and of peacocks, butterflies and moths, changed or lost colour, suggesting perhaps after all the idea of a pigment, but it is not considered that this idea can be maintained. The fading is rather attributed to the breaking down of an interference structure; at any rate, the generalisation still holds good that colour which is stable to chlorine is certainly not due to pigments.

The iridescent colours of feathers and beetles offer many attractive puzzles for the physicist. Visible by reflected and not by transmitted light, they are akin to true Newton's rings. View the tail feathers of a peacock by transmitted light; they have no more colour than the feathers of a crow; with Lawrence we can write "And then the vision faded, but how lovely it had been." Perhaps the most wonderful of all is the alteration in the "interference colours" produced by slight variations in the thickness of the colour producing laminæ, not so much because of the actual change in colour due to a relatively minute change in the thickness of the microscopic films, but rather for the stupendous fact that the same general types of coloured feathers are produced generation after generation with such exactitude. When it is remembered that the delicate beauty of the blended hues of the feather is due to the curvature of the barbules changing the angle of incidence of the light, we realise anew how much nature can perfect with how little. How small in comparison are the works of man in synthesising dyestuffs of which we hear so much.

Chemical Text Books

IN spite of a steady output in recent years of text-books on chemistry and its applications, there is still scope for good standard works, more especially on the industrial and engineering sides. So much new work was done during the war, under the pressure of national necessity, that the difficulty for a time was to bring the literature of the various branches up to the level of actual production achievements. That lag has now been covered, and there has been subsequent advance in many new directions, concerning which students, whether theoretical or practical, desire to have all the new knowledge available. We have recently had inquiries after first-class text books on such subjects as the gums, cellulose and nitro-cellulose, high pressure processes, and so on.

THE CHEMICAL AGE has already introduced a number of new authors to the closely allied publishing firm of Ernest Benn, Ltd., and a considerable chemical and technological library is the result. This service is still open to readers and other members of the industry who contemplate the production of good books on the subjects in which they specialise, and we shall always be glad to hear of suggestions for publications dealing with the science or technology of the newer developments.

Books Received

DIE NATURLICHEN UND KUNSTLICHEN ASPHALTE. By Professor H. Burchartz and Professor P. Wilke. Leipzig: Wilhelm Engelmann. Pp. 254. 19 RM.

HETEROGENE KATALYSE. By Dr. Erwin Sauter. Dresden and Leipzig: Theodor Steinkopff. Pp. 80. R.M. 7.20.

The Calendar

Nov.		
26	*Royal Society of Arts:* "The Chemical Constitution of Coal." Professor W. A. Bone. 8 p.m.	*John Street, Adelphi,* London.
26	Society of Dyers and Colourists (Midlands Section): J. G. Grundy. 7.45 p.m.	Globe Hotel, Silver Street, Leicester.
27	Society of Chemical Industry (Yorkshire Section): Institute of Chemistry (Leeds Area Section): Annual General Meeting and Smoking Concert.	Leeds.
27	Society of Dyers and Colourists (West Riding Section): "Modern Bleaching, Dyeing, Printing and Finishing Machinery for Cotton and Artificial Silk Goods." Peter Urmston.	Bradford.
27	Institute of Metals (Birmingham Section): "Solders." O. F. Hudson. 7 p.m.	Chamber of Commerce, New Street, Birmingham.
27	Chemical Society. Third Liversidge Lecture by Professor Harold B. Dixon. 5.30 p.m.	Imperial College of Science, South Kensington, London.
27	British Chemical Plant Manufacturers' Association: Annual Dinner. Discussion on "Are Chemical Plant Exhibitions Any Use?"	Jules Restaurant, Jermyn Street, London.
28	Institute of Chemistry (South Wales Section): Annual General Meeting. 6 p.m.	Thomas's Café, High Street, Swansea.
29	Institute of Metals (Birmingham Section): Dinner and Dance.	Queen's Hotel, Birmingham.

The Dyestuffs Act to Lapse in January

Government's Official Statement in Parliament

In the House of Commons on Wednesday, Mr. Brooke (Dumbartonshire, Lab.) asked the President of the Board of Trade what was the position of the Government in regard to the expiry of the Dyestuffs Act, now imminent.

Mr. Graham (Edinburgh, Central)—The Government have given full and careful consideration to the position in respect of the Dyestuffs (Import Regulation) Act, 1920, in the light of the Report of the Dyestuffs Industry Development Committee. The Act provided for the safeguarding of the dye-making industry by a system of prohibition subject to licensing, and it was expressly provided in section 5 of the Act that it should continue in force for a period of 10 years, and no longer. That clearly indicated the opinion of the framers of the Act that a period of 10 years should be sufficient to enable the industry to become firmly established, and thereafter to meet international competition unaided. The comprehensive report of the Dyestuffs Industry Development Committee shows that the industry has now reached a stage at which it is capable of meeting a very large proportion of the requirements of dyestuff users in the United Kingdom and of carrying on an increasing export trade, and the manufacturers have indicated their ability to meet normal foreign competition in respect of prices. It appears, then, that the object of the Act has been attained.

The Government have also had under consideration representations from all the interests affected, including the users of dyestuffs and organisations of employers and operatives in the textile industries of Lancashire and Yorkshire. These using industries have represented that the burden of developing the dyestuffs industry during the period of the Act has fallen mainly upon them, and that there is in present circumstances no justification for the continuance of the Act beyond the period originally contemplated. The Government have decided that the Dyestuffs (Import Regulation) Act shall be allowed to lapse at the appointed date, that is, on January 15 next.

Sir P. Cunliffe-Lister (Hendon, U.)—Is it not a fact that the makers of dyes in this country are prepared to give an undertaking, if the Act is continued, that there shall be free entry of any dyes which cannot be manufactured in this country of equal excellence and equal price to the foreign dyes? If that is so, how can any dye-user in this country possibly be prejudiced by the continuance of the Act?

Mr. Graham.—It is quite true that they have made representations in that sense, but there is, of course, controversy even on that point among the users. I cannot give details in reply to a question, but if the matter is raised on the adjournment, or at any other time, I can then give much fuller details.

Mr. Baldwin (Bewdley, U.).—The information which the right hon. gentleman has given is no use at all. This matter is of very vital importance, and the whole House will expect a fuller statement than is possible in answer to a Parliamentary question. I therefore ask formally that the Government will give time at an early date for a full discussion of this subject, and in such a manner that the voice of the House may be ascertained.

Mr. Graham.—That point was raised by my right hon. friend on the last occasion. I said then that I could give no pledge in regard to Government time having regard to the nature of public business; but I said there were other opportunities. Perhaps the adjournment is not a very suitable one; but I see no reason why on a private member's motion the matter could not be discussed.

Mr. Baldwin.—I can only observe on this point that if we are not met it is always open to us to put it down in the form of a vote of censure. (Opposition cheers.)

Opinions on the Decision

The decision of the Government is sharply criticised by some of those prominently associated with the development of the British dyestuffs industry.

Mr. W. J. U. Woolcock

Mr. W. J. U. Woolcock, chairman of the Dyestuffs Industry Development Committee, said:—"We are all tremendously disappointed. After 10 years of solid work we have brought production in this country up from 20 per cent. pre-war to 93 per cent. by weight. Of the outstanding 7 per cent. by weight there are some very important colours, and these represent 20 per cent. in value of what are used in this country. That means that about £1,000,000 worth of dyes is still being imported. To turn us down because we have been efficient does not seem logical. It is a premium on inefficiency."

The Development Committee was appointed to advise the Board of Trade on the efficient and economical development of the industry. Its report on the progress of the industry since the Act came into operation declared that the protection afforded by the Act had given British manufacturers the necessary confidence to develop their works, and had provided them with opportunities for acquiring that skill and technique which were so necessary for the production of dyestuffs of first-class quality and of consistent standards. In addition, manufacturers had been enabled to bring down their costs of production to the lowest economic levels.

Major Freeth

Major F. A. Freeth, research manager of Imperial Chemical Industries, who gave a demonstration lecture on Wednesday on "Dyes and Dyeing" in aid of King Edward VII.'s Hospital Fund, referred to the Government decision. He said that the comparatively simple experiments which his audience had seen were the result of an immense amount of painstaking and original work, and if for any reason national support was not forthcoming for that essential industry, the immediate effect would not be so serious as that which would occur during the next generation. Ten years—the extent of the original protection given by the Dyestuffs Act—was just that slice of a man's life when he came up from a junior position at the university towards his final intellectual level, which should last another 20 years, and if anything occurred to interfere with the development of the minds of people in this country who were already engaged in the industry, the consequences would, he predicted, be eventually disastrous.

"A Great Shame"

Mr. Douglas Hamilton, a former president of the Council of the Bradford Chamber of Commerce, said it would be a great shame if the Act were allowed to lapse unless some effective substitute for it were put in its place. The dye ware manufacturers had captured a far bigger percentage of the total dye ware trade in this country than was ever anticipated, and they had made the most of their opportunities. To repay them by allowing the Act to lapse would be nothing short of scandalous, and he hoped the Government would consider the merits of the case much more carefully than they appeared to have done.

"Very, Very Pleased"

Mr. Forrest Hewit, director of the Calico Printers' Association, said to a *Manchester Guardian* reporter he was very, very pleased to hear that the Government had decided to allow the Dyes Act to lapse. It would help the cotton trade a very great deal in its present depressed conditions, as it meant the removal of something that had been an impediment. The Act had undoubtedly lost them much business.

Sir H. Sutcliffe Smith

A *Manchester Guardian* reporter was reminded that the Colour Users' Association had voted overwhelmingly against the continuance of the Act, but Sir H. Sutcliffe Smith, the chairman of the Association, said that he would not say more for the moment than that he was surprised to see that the Government had come to a decision on this important subject without allowing an opportunity for debate in the House of Commons.

Unemployment in the Chemical Industries

The uumber of unemployed, including those temporarily stopped, in the chemical industry of Great Britain and Northern Ireland on October 27 totalled 15,491, or 14·9 per cent. of the insured persons in the industry. This represents an increase of 0·7 per cent. during the month and 8·3 per cent. when compared with the figures of a year ago.

Sir W. J. Pope on Science and Modern Industry

Where Modern Science Education Fails

The Norman Lockyer Lecture, established by the British Science Guild in memory of its founder, was this year delivered by Professor Sir W. J. Pope, who took as his subject "Science and Modern Industry." The lecture was delivered in Goldsmiths' Hall, London, before a large audience, on November 13, and extracts are given from it below.

MANY thousands of years since, at a time prehistorically distant, man existed on this planet as a creature practically indistinguishable, physically and mentally, from his descendants of to-day. The evidence that modern man is to no appreciable degree the intellectual superior of his predecessor who lived in the far fringe of historic time is overwhelming. Thousands of years since, languages were invented which were probably more expressive and flexible than any modern tongue; great literatures sprang into being depicting every human emotion and aspiration with a delicacy and perfection which still remain unsurpassed. Five thousand years ago the goldsmith and the sculptor were producing gems of art of such loftiness of conception and skill in execution as defy modern competition. It may indeed be asserted that in many of the arts, in literature and perhaps also in such abstract subjects as moral philosophy, no progress has been made for many centuries past; no novel conception has been introduced and the only change consists in the re-presentation of the age-old material in a form which meets the taste of the current period. This seems to force upon us the conclusion that certain forms of intellectual expression were worked out thousands of years ago to the utmost limit of the capacity of the human intelligence. Progress can only be made in those subjects through some development of the human intelligence which will involve its acquisition of fresh powers entirely different from any which it now possesses.

The Scientific Age

We may now consider a few of the ways in which the scientific age differs, and will as time goes on differ still more, from those which have preceded it. Until the invention of the locomotive and the steamship, the speed of travel and of transport had remained practically the same since prehistoric days; it was the rate of progression of a pedestrian, a horseman, a horse-drawn vehicle, or a sailing ship. To-day, we can travel by air at a speed of 100 miles an hour in comparative safety and, since the scientific study of air travel is proceeding apace, such risks of disaster as still attend the new mode of transport must soon practically disappear. From prehistoric times and until the introduction of the electric telegraph, messages could travel no faster than a horse, although a little speeding up by the aid of bonfire signals or rudimentary semaphores was occasionally possible. To-day the spoken word can be transmitted all over the world in a fraction of a second by wireless telephony; the time is not far distant when we shall be able to see events actually occurring on the other side of the world whilst still sitting in our homes. Only a century ago a surgical operation was exquisitely painful and very often fatal; the introduction of anæsthetics has abolished the pain and that of antiseptics has minimised the risk. Not many years since, careful observers warned us that the gradual increase in the world's population was leading us towards a world shortage of vegetable, and consequently of animal, foodstuffs; during the last few years great chemical factories have been established for the application of scientific discoveries to the manufacture of fertilisers from the nitrogen of the air. So rapid has progress been in this direction that not only has the danger of an imminent grain shortage been removed but the world's capacity for producing artificial fertilisers has outstripped the demand.

Scientific Imagination

These are but a few of the countless examples which are available in illustration of the thesis that we are now moving in a scientific age, an age which has already provided us with a more liberal and widespread supply of creature comforts than the whole previous history of the world had been able to produce and which has provided, in addition, more freedom from toil and more leisure for rational recreation and intellectual occupation than could have been dreamt of as possible a century ago. I see no signs at present that a proper use is being made of this freedom and leisure.

The really great advances in natural science rarely result by a purely logical progression from one experimental observation and argued conclusion to the next; they originate in some flight of the scientific imagination which involves a novel idea the applicability of which can be tested by experiment. The undulatory theory of light, which held the field for a century, must have presented itself to Thomas Young as an inspiration which formed the basis for a long series of experiments and calculations. The same kind of thing happens in the great scientific industries. When Ludwig Mond discovered in 1890 that carbon monoxide acts upon metallic nickel at moderate temperatures to give a volatile compound, $Ni(CO_4)$, from which the metal is released at higher temperatures; a great effort of the imagination and a wide knowledge of what can be done in a chemical works led the discoverer to see in this curious scientific observation the basis of the present large scale process for manufacturing pure nickel. Knowledge and imagination have led over and over again to notable advances both in science and modern industry, but only when applied in accordance with the scientific method of careful experiment and logical interpretation of the determined facts.

Since modern industry consists in the application of science to industry and can only remain successful so long as it is carried out on scientific lines, it would seem natural to conclude that yet another condition is essential to success; by success I mean, of course, that it should serve national or even international needs with economy and efficiency. This further condition is that whenever modern industry makes contact with legislative or other controlling bodies it must be treated scientifically; the facts relevant to any particular situation which may arise must be ascertained, logically marshalled, and subjected to the consideration of scientifically trained minds in order that the correct course of action shall be determined. There is, unfortunately, little ground for believing that this essential condition is always present to the minds of our legislators; and yet it would not seem difficult to understand that a complicated and delicate scientific instrument such as one of our modern industries would be wrecked by unscientific handling. To illustrate this question, and to point out certain imminent dangers, it is necessary to discuss one specific instance in some detail.

Dyestuffs

In 1856, our fellow-countryman, the late Sir W. H. Perkin, made the first coal-tar dyestuff, Perkin's "Mauve"; this important discovery was quickly followed by others of a similar kind and, at the present day, over 1,000 distinct coal-tar dyes are being manufactured and sold. For many years a flourishing coal-tar colour industry existed in this country but gradually, and for reasons which need not be now discussed, pre-eminence in the coal-tar dye industry passed to Germany; at the outbreak of war this country was only producing about one-fifth of the dyes required by its great textile industries. In time of war, coal-tar colour works can be quickly reorganised for the manufacture of high explosives and other munitions. At the outbreak of the great war one dyestuff intermediate, toluene, essential in the manufacture of the high explosive, trinitrotoluol, was produced in but small quantities in this country and, owing to lack of plant and other facilities, a long delay ensued before reasonable supplies could be obtained from coal-tar. Fortunately, it was found possible to secure large supplies of a particular kind of petroleum from Borneo which contained a high percentage of toluene; this proved a valuable auxiliary, especially during the early days whilst the work of organising the large scale separation of toluene from coal-tar and coal-gas was in progress.

Government Policy

The Government was impressed in 1915 by the necessity for a strong British dyestuff industry and the sympathy thus aroused found practical expression in the granting of large financial assistance. Ultimately, the Dyestuffs (Import Regulation) Act came into effect as from January 15, 1921.

It would be difficult to find a parallel in peace-time legislation to so drastic an enactment, yet the Dyestuffs Act seems to have worked with very little friction; it has certainly had fundamentally important consequences. Under the shelter of the Act the economical manufacture of dyestuffs has developed rapidly in this country, and prices have shown an astonishing diminution. Thus, one particular dye, when made only in Germany, was sold in England at 37s. 6d. per lb., but, when it had been successfully produced at home, the quotation fell to 15s. per lb.; the price of another fell under similar conditions from 12s. 3d. to 6s. 4d. per lb., and yet another from 9s. 6d. to 3s. per lb. Since these colours are consumed in large quantities, it is clear that the textile industry has in the past been paying a heavy toll to the German manufacturers in the form of huge profits on monopoly articles.

Other advantages have accrued simultaneously. The growing demand for young chemists has led to an increase in the numbers of chemical students in our universities and technical colleges; a greater number of young chemists than ever before is now available to serve the needs of our growing chemical industries.

It is generally conceded that the passing of the Dyestuffs Act of 1920, involving the fresh precedent of entire prohibition of imports of previously untaxed manufactured products, placed in the hands of modern industry a scientific instrument which has proved of enormous value; at the same time, a curiously unscientific provision was introduced limiting the operation of the Act to ten years. The provision in question was unscientific in that it involved the assumption that a legislative body could foresee what would be the position of a very complex scientific industry ten years later, an assumption which obviously attributes miraculous foresight to a very human association of men. The existence of this unscientific provision has given rise to an embarrassing position; the Dyestuffs Act expires on January 14, 1931, just two months hence, but the Government has given no indication as to whether it proposes to renew it or to allow it to lapse.

Practically all the relevant details concerning the operation of the Dyestuffs Act have been published and their consideration has led me to the conclusion that if the Act lapses our present flourishing dyestuff industry, built up so laboriously by the last ten or fifteen years of intensive effort, will fall into decadence.

Our Hand-to-Mouth Methods

Unfortunately, some of the great industries of this country cannot be described as modern; they are archaic in their methods and outlook. They do not discern the wisdom of spending large sums on research work in the confident anticipation that the expenditure will be repaid a thousandfold in profits to be made years later; when times are good, the returns on invested capital are so large that the manufacturer feels no incentive to install newer and more economical methods of production and when times are bad he has no money available for development purposes. This hand-to-mouth policy is quite contrary to the spirit of modern industry. Whilst these remarks are applicable to certain of the great manufacturing industries of the country they bear more particularly upon the oldest, perhaps the greatest and certainly the most conservative of all our British industries, that of agriculture. The resuscitation of agriculture in this country calls for the application of intensive methods of cultivation, with mechanical aids, and of scientific fertilisers, to much larger individual holdings than at present. Despite the great progress made in recent years in the manufacture and uses of artificial manures, far too little advantage is being taken of them by the English farmer. An official Committee for the investigation of Production and Market Conditions of German Industry has just published an illuminating report in Berlin. It appears that the strictly chemical industries of Germany, excluding the purely metallurgical ones, now find employment for 320,000 workers. Formerly the textile industries were the largest consumers of chemical products; to-day, agriculture is by far the largest domestic customer of German chemical products.

Since modern industry is highly scientific in character it would seem to follow that an early education in science is well calculated to fit a young man to take up an industrial career; it is indeed noteworthy that during recent years the number of science students who secure important appointments on the administrative side of industry has been rapidly increasing. It may well be questioned whether the school education of to-day is a satisfactory one for the lad who intends to devote himself to either science or productive and progressive industry. Two totally distinct subjects have here to be considered, namely, education and instruction. Education consists in expanding the powers and resources of the mind whilst instruction consists in filling it with information; it is much more easy to instruct than to educate. The young intelligence is naturally so receptive and the young memory can be so easily trained that an alert lad of eighteen years of age is generally capable of absorbing information at a prodigious rate and of retaining it for a time with remarkable tenacity.

The Cramming System

The trained memory is one of the most astonishing things, and its existence has given rise to the school cramming system which is now, and has long been, so prevalent; I repeatedly find young men entering the university already equipped with a sufficient knowledge of theoretical organic chemistry to see them through the honours degree examination which they are to take some years later; they bring with them sets of notes on the subject in which parts are sometimes underlined in red ink as indicating matters on which the examiners may be expected to ask questions. Whilst the young man is so satiated with all this detail that he is stale and weary of science, he has generally had little laboratory training and his elementary education has often been deplorably neglected; his handwriting and spelling are frequently execrable and his knowledge of the great leading facts and ideas underlying chemical science is often very imperfect. Furthermore, it is rare to find a young science student who can read any continental language with ease and rarer still to find one who can understand a spoken foreign tongue.

I do not advocate a return to the classical and mathematical education of former days; we have in natural science a mental discipline far more stimulating than the study of a dead language even when supported by an incomparable literature. But we do require that the schools should provide an education in the broad principles of the natural sciences and methods, supplemented by liberal and simple courses of practical work in the laboratory. The young man who enters upon a career in modern business or industry with a good classical school education but with no knowledge of science does so with one-half of his brain atrophied.

Society of Chemical Industry

Birmingham and Midland Section

THE winter session of the Birmingham and Midland Section of the Society of Chemical Industry was opened with a meeting at the Birmingham Chamber of Commerce Building on Tuesday, when Mr. F. Weinreb read a paper on "Stoneware in Chemical Industry." On December 2, Dr. R. S. Morrell (Messrs. Manders, Wolverhampton) will speak on "The Oxidation Products of Drying Oils"; on January 13, Mr. E. C. Rossiter on "Resins Derived from Urea and Thiourea"; on February 10, Mr. J. H. Dickenson on "The Manufacture of Heavy Steel Forgings for the Chemical Industry"; on March 10, Mr. E. C. F. King on "Rustproofing of Iron and Steel"; on April 14, Mr. F. R. O'Shaughnessy on "Modern Methods of Sewage Disposal." By invitation of the committee of the Birmingham Section of the Institute of Chemistry, Mr. H. A. Bagnall, Birmingham City Analyst, will give, in February at a date to be fixed, a lecture on aspects of work of his department; and on January 23, the members of the Society of Chemical Industry will, on the invitation of the committee of the Chemical Engineering group, make a visit of inspection of the experimental plant of Mining Equipment, Ltd., Derby.

This year's chairman of the Midland section is Mr. E. D. Mason, in succession to Mr. W. A. S. Calder, who becomes a vice-chairman with Mr. W. R. Barclay and Mr. A. W. Knapp. The committee are Professor N. W. Haworth and Dr. S. R. Carter (Chemistry Department of the University of Birmingham). Mr. A. J. Broughall (Chemical Engineering Section), Dr. A. G. R. Whitehouse and Messrs. J. R. Johnson, R. Mandsley, D. W. Parkes, H. W. Hewis, A. A. King, C. W. Mobberley and H. W. Rowell; with Mr. W. T. Collis (honorary treasurer), Dr. C. A. Fox (hon. auditor) and Mr. G. King (hon. secretary), *ex officio*.

Research in the Paint and Colour Industry

Sir Ernest Rutherford on the Origin of the Scientific Age

Reference to the achievements of the Research Association of the British Paint, Colour and Varnish Manufacturers during its first five years of Governmental assistance was made at a luncheon held at the Holborn Restaurant, London, on Wednesday, when Sir Ernest Rutherford proposed the toast of the Association. At a subsequent meeting several resolutions were passed regarding its future conduct and maintenance.

OVER two hundred people were present at the luncheon of the Research Association of the British Paint, Colour and Varnish Manufacturers, held at the Holborn Restaurant, London, on Wednesday. In the absence of Lord Melchett the toast of the Association was proposed by Sir Ernest Rutherford, President of the Royal Society and Chairman of the Advisory Council of the Department of Scientific and Industrial Research. Sir Harold Hartley, Director of Research to the London, Midland and Scottish Railway, Sir Robert Robertson, the Government Chemist, and Sir Richard Allison, chief Architect to the Office of Works, were also among the speakers. Other guests included: Dr. G. C. Clayton (President, Institute of Chemistry); Mr. A. H. Davis (President, National Federation of Associated Paint, Colour and Varnish Manufacturers of the United Kingdom); Lt.-Gen. Sir Wm. Furse, K.C.B., D.S.O. (Director of the Imperial Institute); Mr. Noel Heaton (President, Oil and Colour Chemists' Association); Mr. H. A. F. Lindsay (Trade Commissioner, India House); Mr. E. M. Lloyd (Assistant Secretary, Empire Marketing Board); Dr. F. E. Smith, C.B., F.R.S. (Secretary, Department of Scientific and Industrial Research); and Prof. J. F. Thorpe, F.R.S. (President, Chemical Society).

Sir Charles A. Mander occupied the chair in the absence of the President (Mr. S. K. Thornley) who is visiting South Africa for health reasons.

Achievements of the Association

Sir Ernest Rutherford, in proposing the toast of the Research Association of British Paint, Colour and Varnish Manufacturers, referred to the enforced absence of Lord Melchett and wished him a speedy recovery. Their Association, he continued, was only four and a half years old and he was surprised at the rapidity with which the laboratories had been organised and at the amount of good work that it had done. Thanks to Mr. Thornley, the Council and the energy of the Director, Dr. Jordan, it was a model for many other Associations and had achieved as much during its brief existence for British industry as its counterpart in America had done in 20 years.

What, asked Sir Ernest, should be the ideal of an Association of this kind? The first thing was to keep its members in close touch with developments of professional interest. Secondly, they had to make *ad hoc* research into the pressing difficulties of the manufacturer. Such research on specific problems might be lucky or it might be unlucky, but it was necessary. Thirdly there was long range research, dealing not with the needs of the moment but with the object of increasing the fundamental knowledge on which the industry was based. The industry was very old and very complicated, and the best form of research was a happy conbination of the three methods mentioned. Their industry was much older than many of them thought, and they were probably not aware how much it had been responsible for modern civilisation. A distinguished friend of his, an anthropologist, once informed him that the use of paste paints by the ladies was really responsible for the modern scientific age. In explaining that theory his friend said they had definite evidence that the ladies at the dawn of Egyptian civilisation adorned their features with a paint made from malachite. It was easy to understand how some husband might have become irritated with his wife's adornments and thrown some malachite into a fire. Hence the copper and bronze age! At a later age women were addicted to the use of rouge, and when rouge was thrown into a charcoal fire iron would result. Hence the iron age! (Laughter.) That line of argument might be fanciful, but there was one thing of which they were certain —that the origin of their industry was based on scientific knowledge. The old alchemist had prepared the pigments and paints for the artists of his day, and now it was quite right that this industry should return to its scientific allegiance, and also assist science so far as such methods were possible.

What would be the future of the Association after the expiry of its first five-year period? It seemed to him that the one time that the scientific side of an industry needed supporting was at a time like the present. There was going to be even fiercer competition, based on science, between the nations of the world, and the nation that applied to the utmost scientific methods would succeed. As a nation we had the money, the brains and the horse sense to enable us to hold our own in any industry in the world, but our efforts must be based on the application of science to that industry. Sir Ernest concluded with a reference to the great value of research into the possibility of producing tung oil within the Empire. This was long range research. Few could take advantage of it at the present time, but it offered great promise for the future.

Difficult Problems

Sir Robert Robertson, who seconded the toast, said he had had to follow the work of the Association and he had known its Director since 1914 when he came to learn the gentle art of making tri-nitro-toluene at Woolwich. The problems of the paint industry were particularly difficult, they were dealing with a substance that had no crystals such as the more fortunate inorganic chemist had to deal with, and it is necessary to take advantage of every scientific development of the present day. Organic chemistry was called in because with substances such as tung oil and linseed oil, only by a knowledge of their constitution, could you arrive at a knowledge of their properties. Colloidal research called for the physical chemist, and the physicist was required for the investigation of the reflection of light from painted surfaces, the size of particles and the elimination of bloom. Much success had been achieved and he wished the Association even more in the future.

Sir Richard Allison, chief architect of the Office of Works, supported the toast, and gave some interesting figures from the standpoint of the Government as one of the greatest consumers of paints. The Office of Works had the oversight of some 6,000 buildings, which had to be maintained at an annual cost of £300,000. Of this figure labour costs absorbed some 75 per cent., so that it could be seen that the obvious direction for economy was to use the best possible materials. By this policy they had been able to extend the length of the interval between repainting. If they were to revert to the ordinary method of painting every three or four years the cost would be £100,000 a year more. An extension of a single year meant a saving of £25,000, even allowing for an addition of 10 per cent. in the cost of the material for its improved quality.

Responding to the toast, the Chairman spoke of the great value to the manufacturer of the work of the Association, the technical staff of which now included ten graduates. The fact that the Government, the railway companies and other important users were constantly asking for help in their problems showed that people outside also believed that their research ought to be supported. On the question of tung oil developments within the Empire, he could not agree with Sir Ernest Rutherford that this was a "long shot," and he had hopes of speedy developments. Two financial matters alluded to by the Chairman were the spending of £3,500 on adding a flat-roofed building to their station at Teddington, where the durability of paint could be more thoroughly tested, and the gift of £600 from the Carnegie trustees for technical literature.

Larger Users and the Association

After the luncheon, Sir Harold Hartley, Research Director of the L.M.S. Railway, spoke briefly on the general question of paint and varnish research and the position of the larger users. He had spent a day recently, he said, looking at the Association's laboratories from the point of view of a user, and he had found that they were being put to excellent purpose. They were not luxurious, but he could tell from long experience when people were making good use of a laboratory. The men there, Dr. Jordan, Dr. New and Dr. Culter, had the long distance point of view, but they also had shrewd eyes for the immediate result. At a time of financial stringency, the user members

of the Association could be of considerable assistance in supporting research if they were allowed to have some of the advantages. There should be no difference in the point of view of the user and the manufacturer. On the subject of relative costs of labour and material in painting structures, Sir Harold said if he had to have a bridge painted by hand, the cost of the labour was three times that of the paint, but if he sprayed the paint, the cost was equal.

Resolutions

At a subsequent general meeting three resolutions relating to the future conduct of the Research Association were carried unanimously. The first, moved by Sir Charles Mander, and seconded by Mr. Noel Heaton, "approved the general principle of the Research Association for the industry and congratulated the officers on its establishment, and further approved of the plans being made to ensure the Association being carried on for a further period of five years."

The second resolution expressed the opinion "that in order to provide for the successful continuance of the work of the Association on the lines required by the industry an income of £10,000 to £11,000 is necessary." It was proposed by Mr. S. R. Hadfield and seconded by Major T. G. Mellor.

The third resolution empowered the Council of the Association to determine the subscription basis for the second five-year period on a scale sufficient to ensure the required income.

The luncheon was preceded by the fourth annual meeting, also held at the restaurant, Mr. S. R. Hadfield presiding in the absence of the President. The report and balance sheet, the latter showing a satisfactory balance in hand, had both been circulated to the members and were unanimously adopted. The officers, Mr. S. K. Thornley, president, Mr. J. Russell Thornbery and Dr. H. H. Morgan, vice-presidents, and the auditors, Messrs. Smith and Harding, were all re-elected. A postal ballot to fill four vacancies on the Council resulted in the election of Messrs. P. Murray (Lewis Berger and Sons, Ltd.), C. Allen (Leyland Paint and Varnish Co., Ltd.), Clement (Imperial Chemical Industries), and A. B. Shepherd (British Oil and Cake Co., Ltd.).

Properties of Insoluble Azo Colours on Fibre

Address by Professor Rowe

Professor F. M. Rowe, one of the expert witnesses in the prolonged patent action between I.C.I. and I.G. heard before Mr. Justice Maughan, and the head of the Colour Chemistry and Dyeing Department of Leeds University, delivered an interesting lecture before the London Section of the Society of Dyers and Colourists on Friday, November 21.

In the course of his address, Professor Rowe said that in the recent action between Imperial Chemical Industries, Ltd., and I.G. Farbenindustrie A.-G., the former firm asked that three English patents granted to the latter firm should be revoked, on the grounds of prior publication, common general knowledge, and insufficiency of description. The patents related to the production of insoluble azo colours from certain arylamides of β-hydroxynaphthoic acid, and attempted to re-patent without proper reasons manufactures which had already been patented in 1912–1914. If this attempt had succeeded, it would have been a serious matter, not only to dyemakers in this country, but also to dyers, who would have, been subjected to coercion in making their purchases. Thus, whilst dyers could have purchased naphthols and bases from any manufacturer, they could have made certain combinations of these only under licence from the I.G. The revocation of these patents liberated dyers from these restrictions, and led also to an important judgment on the subject of valid chemical selection patents, viz., that the selection must be for a useful, and special, characteristic or property indicated in clear terms by the patentee.

Some Interesting Tests

The state of knowledge in 1912–1914 was reviewed, the claims of the three selection patents, which were revoked, were discussed, and the results of dyeing 417 of these azo colours, and testing them in the laboratory and on the large scale, were described. The advantages claimed in the selection patents were greater fastness to kier-boiling, a greater capacity for being discharged to a good white, and greater fastness to light than unselected dyeings. A series of dyeings with the unselected Naphthol AS-RL was on the whole faster to light than a corresponding series with any of the selected compounds, and dyeings with the unselected Naphthol AS-BS were the most easily discharged of all. The real point at issue, therefore, was the comparative fastness of selected and unselected dyeings to an undefined kier-boiling, a process to which calico prints and pigments in substance, which the selection patents also attempted to cover, are never submitted.

Testing for Fastness

The testing of dyed cotton for fastness to comprehensive bleaching, *i.e.*, kier-boiling and chemicking, was discussed in detail, with particular reference to the method proposed by the German Fastness Commission, whose so-called standards and type dyeings were adversely criticised. In grading the fastness to kier-boiling of azoic dyeings, the factors involved were loss in depth, change in shade, and staining of the white as a result of boiling alkali, together with the favourable or unfavourable effect of subsequent treatment with hypochlorite on both the dyed and white material. The results were judged by a summation of these factors on the basis of what would be, or what would not be, regarded as commercially acceptable.

Conclusions from Tests

Conclusions drawn from the experiments were :

(1) The use of caustic soda solution in a laboratory test is much less stringent than the same strength caustic soda solution used for the same period on the large scale.

(2) The use of 0·36 per cent. caustic soda in a laboratory test is an admirable means of determining the relative fastness to kier-boiling of a series of dyeings belonging to the same chemical class and not very sensitive to reduction, but is much more stringent than the use of 0·5 per cent. soda ash solution for the same period on the large scale. To this extent it allows a margin of safety, but at the expense of limiting the number of dyeings, which can be subjected safely to open kier-boiling with soda ash on the large scale.

(3) The presence of a nitro-group in an azoic colour has an adverse effect on the fastness to kier-boiling of the dyeing. A laboratory test with caustic soda is quite unsuitable for determining the degree of fastness of these dyeings containing nitro-groups to open kier-boiling with soda ash on the large scale.

(4) Whether judged by laboratory or large scale tests, the selected combinations exhibit similar variations amongst themselves, as do the unselected combinations. The patentee's attempt to relate the general possession of a high degree of kier-boiling fastness with the chemical constitution of the arylamide of β-hydroxynaphthoic acid employed, could not be substantiated.

(5) The possession of resistance to kier-boiling is a specific property of a particular azo-compound, and cannot be attributed to either of its components.

(6) A large number of azoic dyeings possess satisfactory fastness to kier-boiling as carried out in this country with coloured goods, whilst many are quite unsuitable for this purpose.

Finally, quantitative experiments, carried out with Dr. S. Ueno, to determine exactly what is the action of boiling dilute caustic soda on insoluble azo compounds on the fibre, were described. A dyeing with diazotised *o*-chloroaniline and the *p*-anisidide of β-hydroxy naphthoic acid appeared to be almost stripped by this treatment. This was mainly due to the physical changes of aggregation and migration of the chemically unaltered colouring matter, but about 14 per cent. was destroyed, partly by reduction of the azo-group and partly by hydrolysis of the arylamide group. If the colouring matter contains a nitro-group, *e.g.*, the dyeing with diazotised 5-nitro-o-toluidine and the *p*-anisidide of β-hydroxynaphthoic acid, the further chemical change of reduction to the corresponding aminoazo-compound occurred to the extent of about 25 per cent. of the original colouring matter present on the cotton, and about 18 per cent. was destroyed also by complete reduction and hydrolysis.

Central Headquarters for Science and Technology

A Great Gathering at Guildhall

ONE of the largest and most distinguished companies of scientists, technologists and public men organised for many years in London sat down to dinner in the beautiful City of London Guildhall on Thursday, November 13, to meet the Prince of Wales and informally to launch the scheme for the erection in London of a central headquarters to house a considerable group of scientific and technical associations, including the Chemical Society, the Society of Chemical Industry, the Institution of Chemical Engineers, and the Association of British Chemical Manufacturers.

Sir Ernest Rutherford, president of the Royal Society, who presided at the dinner, received the 500 guests in the Art Gallery. He was supported by Sir D. Milne-Watson and other presidents of the constituent institutions and associated bodies.

Sir John Cadman Explains the Scheme

Sir John Cadman, hon. treasurer of the Empire Council of Mining and Metallurgical Institutions, proposed the health of the Prince of Wales. He spoke of the support that the Prince had given to the movement when it was launched eight years ago, and said that his presence that night would encourage members of the Empire Council all over the world and of the constituent bodies of the association in the United Kingdom—numbering in all some 30,000 men and women—to go forward with their plans which had, he understood, received the cordial endorsement of the Imperial Conference and of the various Departments of the Government. To-day they were embarking on a development which was the natural and logical outcome of the action taken eight years ago to form the Empire Council—namely, to raise funds to house under a single roof the scientific and technical institutions connected with minerals, metals, chemicals, fuel, oil and rubber.

Describing the constituent bodies of the association as the clearing house, and to some extent the breeding-ground, for most of the ideas and discoveries that had made possible the development of the heavy industries of the world, Sir John Cadman said that their immediate aim was to promote the interchange of ideas between the exponents of the various branches of science, and between them and the leaders of industry, most of whom united scientific qualifications with practical knowledge. It reflected no little credit on the councils of the constituent bodies of the association that they should have so readily agreed to abandon the homes which some of them had occupied for half a century, to pool their libraries, and, while retaining to the full their autonomy and their individuality, to consent to become organic parts of a greater whole to provide which the association was now appealing for funds. It was a good omen for the future, as also was the fact that several of the principal organisations of producers and manufacturers connected with the industries immediately concerned had agreed to make their headquarters in the same building. The Prince had brought to bear on the problems of the Empire imagination and sympathy, and his spontaneous efforts towards unity in every department of life were matters not only of common knowledge but of Imperial history. (Cheers.)

The Prince's Reply

In his reply to the toast, the Prince said :—

When I first heard of the scheme of which this association is the outcome, I welcomed it heartily, and I am glad to think that not only has the original object to which I gave my support eight years ago been achieved, but that out of it has grown a much greater enterprise. That this should have come about does not surprise me when I see so many distinguished and learned men included in your council of management; and membership of your association will, I feel sure, be counted a privilege, so wide a field of industry and research do you cover. You have inaugurated a movement which, if steadily supported and wisely guided, may confer benefits upon industry as a whole, both in this country and in the Empire, the extent of which we can only dimly foresee. The Empire Council of Mining and Metallurgical Institutions has done much to help us to reap the full benefit of the wonderful mineral resources which our Empire contains, and I believe that this association may have a not less beneficial effect in an even wider sphere by promoting what an enlightened American recently referred to as "the four C's"—contact, consultation, confidence and co-operation. (Cheers.)

The time has long passed when any one industry, or any one branch of science, could hope to develop to its full stature without an intimate knowledge of what is going on in other departments of human activity. To say that further research is urgently necessary in almost every branch of industry and science is almost a truism. The great problem of power cannot be attacked from any single angle. The chemists and the metallurgists, the engineers and the fuel technologists, all have a great part to play in making a ton of coal, or, for that matter, a ton of oil, more valuable to the nation to-morrow than it was yesterday. There is the great problem of the better utilisation of the energy contained in a ton of coal, involving technical and commercial problems towards the solution of which the members of this association may make contributions of decisive value, involving, as it does, almost every branch of physical science. This generation has witnessed the production on a great commercial scale of agricultural fertilisers as by-products of the iron and steel industry and of the gas industry, and, more recently, under the guidance of Lord Melchett, whose absence to-night owing to indisposition we all greatly regret, direct from coal and air, both products of which the British Empire has no lack.

Coal and oil are both forms of power. Oil is essentially a portable fuel, which can be converted into power as we require it at a moment's notice. Coal, burnt at a central station, delivers energy at the gates of our factories, at the doors of our homes, and in our streets, by means of electric wires or in the form of gas. It is dangerous to speculate in the presence of an assembly such as this on future developments, but I am tempted to wonder whether I may not live to see lorries in which the petrol tank has been replaced by a bottle of compressed gas, carrying the products of agriculture, grown with the aid of fertilisers derived from coal, to clean towns no longer defiled by coal as used to-day.

I warmly endorse all that Sir John Cadman has said regarding the importance of the association under whose auspices we meet to-night. The sum required is large, but it is insignificant in comparison with the importance of the industries concerned. That the required amount will be raised before long I am confident. May I remind you all that the condition of these industries is such that much depends upon its immediate realisation? We cannot afford to wait.

May I conclude by congratulating the president and the councils of the constituent bodies on the foresight and wisdom they have shown in associating themselves so readily with this movement and the promoters on the energy they have displayed in bringing it thus far to completion? I feel sure that the outcome will be a still greater scientific development of the resources, not only of this country but of our Empire as a whole, which is bound to have a favourable effect on the course of wages and of industry. To such a result all of you here to-night can contribute, and, knowing what has been done in the past by the individuals and institutions represented in this hall, I feel certain that you will. I ask you all to raise your glasses to the early success of the association. (Cheers.)

Truly Imperialist

Sir Robert Horne, M.P., thanked the Prince for the encouragement and stimulus he had given to the association, which aspired to be a truly Imperialistic organisation. The purpose of all scientists was to serve human progress, and by pooling their knowledge they could render a great service to the Empire. The world was gradually forming itself into great aggregations, and no nation could any longer live a separate existence. Europe was trying to set up a balance with the great economic forces in the United States. Our position was plain. Our destiny lay with our own people, and, whatever the society might accomplish in the future, he was sure that we in the Mother Country would stand together with the young and virile nations which had sprung from our shores to carry to the ends of the earth the traditions of British rights and justice and the sweetness of British life.

Dr. G. C. Clayton, president of the Institute of Chemistry, who also spoke, referred to the immense services that had been

rendered to science by the Royal Family for a period of nearly 300 years, and recalled that King Charles II was personally responsible for the foundation of the Royal Society.

Sir Auckland Geddes, responding to the toast of "The Guests," proposed by the Chairman, said that it was important that the great industries of the country should come to the help of the scientific societies. It was equally important that science and the men of science should come to the help of industry. A great need was pressing still more heavily on both sides. He hoped that to the thousands of pounds his associates had promised to contribute they would be able to add as many thousands again if the great scheme was carried forward of equipping a library on a great scale and of providing a central building for the whole of the scientific and technical organisations, to whom they must turn for guidance and advice as to the selection of staff.

Sir William J. Larke, president of the Iron and Steel Federation, announced a gift of £10,000 from Mr. Robert Mond towards the scheme for setting up and equipping a central building for the organisations.

Mr. Eric Macfadyen, president of the Institution of the Rubber Industry, also replied.

The Applications of Asphaltic Bitumen

Address to Oil and Colour Chemists Association

Mr. J. S. Jackson, chemist in charge of the Shell laboratories, read a paper on "Asphaltic Bitumen, Its Properties and Applications" at the monthly meeting of the Oil and Colour Chemists Association in London on Thursday, November 13. Mr. Noel Heaton (President) was in the chair.

HAVING regard to the storm of controversy that had raged round the term bitumen, said Mr. Jackson, he wanted to make it clear that he confined his paper to the petroleum products which either occur naturally or are prepared in the refinery by the distillation of asphaltic base crude petroleums. This bitumen had been known and used for many thousands of years. The astounding development in the use of bitumen which had taken place in the last 10 or 20 years, however, rendered it necessary that we should increase our knowledge of its properties. In spite of the existence of the famous deposits in Trinidad, where the quantity of natural asphaltic bitumen was estimated at over 9,000,000 tons, and of other similar deposits, the greater part of the bitumen used to-day was artificially prepared by the removal of the more volatile constituents from asphaltic base crudes, which occur in Mexico, Venezuela, California, Egypt and other parts.

The various grades of bitumen were usually classified according to their consistency as measured by the penetration test. Bitumen was a material requiring very careful and sympathetic handling. It might almost be described as a product with a temperament and few people, outside a select band of bitumen specialists, appreciated the great need for patience, care and technique in handling bitumen if accurate analytical results were to be obtained. Striking hysteresis effects were encountered and very misleading results could be obtained in the laboratory unless special care was taken. Fortunately such features were not of equal importance in large scale operations, and as regards ductility and adhesiveness bitumen was peculiarly resistant to the determined efforts of many operatives to destroy those valuable properties. At the same time, it was suggested that perhaps too much importance has been attached to the ductility test in the past owing to the difficulty of gauging the actual practical importance of ductility. Tests had shown that whilst the ductility increased with increasing temperature up to a certain point, with further rise of temperature the ductility decreased very rapidly. Many purchasing specifications called for a ductility of 100+ at 25 deg. C., but a moment's consideration of a typical ductility curve indicated how ill-advised it was to specify both the temperature and the ductility figures, as it often happened that 25 deg. C. did not fall on the peak of the curve. Where ductility was essential it would be better that the bitumen should be ductile at reasonably low temperatures.

The Chemistry of Bitumen

The chemistry of bitumen was still very obscure and we could only say that it consisted essentially of complex hydrocarbons and that sulphur appeared to be an important, if not essential, constituent. Small quantities of oxygen and nitrogen were also present. In the laboratory it had proved useful to split bitumen into three groups of compounds (*a*) the oily constituents, (*b*) the sticky resinous constituents, which had been called bitumenes, and (*c*) asphaltenes. The last were probably the essential and most characteristic constituents of bitumen as we know it. They were the constituents which were insoluble in volatile petroleum ether, and as obtained by such precipitation they were brownish-coloured solid bodies.

The so-called bitumenes were the semi-solid resinous sticky constituents occupying the middle of the series between the liquid oils and the solid asphaltenes and the only method of estimating these bodies was to estimate the asphaltenes separately and then removing the asphaltenes and bitumenes from the original bitumen by sulphonation with 100 per cent. sulphuric acid. The percentage of bitumenes could then be arrived at by difference. By blowing air or a mixture of air and steam through bitumen at a temperature round about 275 deg. C., the normal properties of the material could be strikingly modified. The exact nature of the change taking place was obscure but possibly it was the elimination of hydrogen. The result, however, was that the melting point of the bitumen was considerably raised and the blown bitumen was distinctly "rubbery" in character and showed some measure of elasticity.

After alluding to the various applications of bitumen, the author said the softer grades could be emulsified quite readily, and various types of emulsions provided a simple and effective method of applying cold bitumen to a multitude of purposes. Although an astounding number of patents had been taken out for emulsifying bitumen, we had settled down to the very simple method of preparing bitumen emulsions in some form of colloid mill. Whilst this provided a satisfactory method of manufacture, however, it was not necessarily the best form of laboratory apparatus for the study of these emulsions, and it had been found that the emulsification of bitumen could be very conveniently studied with a small steam-heated mechanical mixture. Using clay as an emulsifying agent had the effect of protecting each particle of bitumen against ordinary atmospheric ageing influences which it had been claimed increased the life of the bitumen and made such mixtures valuable for painting pipe lines, etc. It had also been claimed that the presence of the clay decreased the susceptibility of the bitumen to temperature changes, delaying the softening effect.

Elimination of Hydrogen

The President said it was refreshing to have such a frank statement as to the chemical knowledge of bitumen. He was interested in the blowing of bitumen and the change of properties that took place, due not to any oxygenation, but to the elimination of hydrogen. That seemed to be a novel point. In practice one of the greatest objections to bitumen and to its extensive use was its appalling colour.

Dr. L. A. Jordan expressed agreement with what Mr. Jackson had said, that most ordinary people looked on bitumen as a very raw material—the rawest of raw materials—and, generally speaking, they were not to be blamed, but the next few years would see a very big difference in the use of bitumen as a film-forming material.

Mr. Jackson, replying to the discussion, said bitumen is one of those unfortunate subjects about which it was very easy to ask questions, and very difficult to answer them. Sulphur did undoubtedly eliminate hydrogen, but also quite definitely some sulphur remained and combined with the bitumen. In any case, in the process of sulphurisation it was a difficult matter to introduce just exactly the required amount of sulphur. The colour of bitumen presented a much more difficult matter. He believed that Nillensteyn had definitely established the presence of free carbon although the quantity was not considerable. It was there in a colloidal condition. The asphal-

tenes were dark brown in colour and they were probably the chief colouring constituents. As to the nomenclature of bitumen, the matter was very complicated. There had been a strenuous endeavour to clear up the whole thing, but it had become almost a matter of international politics. The petroleum residue was to be called asphaltic bitume, that being a miserable compromise to satisfying the Americans and some people in this country (laughter). In this country the term "asphalt" meant the mixture of bitumen and mineral aggregate as used on the road and so people talked of asphalt roads. In America asphalt was the binding material. But there was going to be a very definite and dogmatic announcement as to what these different things were to be called in the near future.

Patents, Trade Marks and Designs

An Interesting and Useful Handbook

"PATENTS, Trade Marks, and Designs," is the title of an interesting and informing handbook just issued by H. T. P. Gee (of Gee and Co., patent agents), whose name will be familiar to our readers as the compiler of the "New Chemical Trade Marks" appearing weekly in THE CHEMICAL AGE. The object of the booklet is to present in brief outline the procedure to be followed in patenting inventions and registering trade marks and designs, both British and foreign. It deals with the salient points coming within the day-to-day experience of the author and is therefore very closely related to practice. For information on the more technical and legal aspects of the subject, the reader is referred to the standard works. Copies, we understand, may be obtained by readers on application to the author at Staple House, 51-52, Chancery Lane, London, W.C.2.

History of the Patent System

The introduction to the book contains a brief sketch of the early history of the grants of industrial monopolies or privileges, out of which the patent system for new inventions gradually grew :—

The system of granting monopolies or privileges is of early origin, going back for many centuries. They were originally granted by the Crown to foreigners in return for the establishment by them of new industries in this realm. During the Middle Ages many of the Continental countries were in advance industrially of England. Even up to the 16th century manufactured goods from the Continent were exchanged for our raw materials, examples of which are cloth and wool, tin and lead. Grants of privileges were made as far back as 1336 to two weavers of Brabant to settle in York, to three clockmakers of Delft in 1368, to John of Schiedame with his company in 1440 to manufacture salt, and to miners from Bohemia in 1452, the underlying motive for the grants being the introduction into the realm of new industries. These grants were all made to Continental artificers. The rise of the cloth industry in the 14th century is considered to be due to the encouragement given to it by the Crown. It appears from a statute of 1555 that some merchants of Norwich, who introduced some Italian workmen into their employment, were granted a monopoly for the manufacture of satins, etc. Groyett and Le Leuryer were granted a monopoly for the manufacture of white soap in 1561. At about this period French iron-founders were introduced, and the casting of iron ordnance appears to have been established by them in the Weald district.

In Tudor Times

The grants having been found to be beneficial to industry, the alien craftsmen were accorded the privilege of freedom from competition, the protection thus given being akin to that given at the present day by Letters Patent. The system of protection granted to the foreigner was extended to the home worker who assisted in enabling articles to be made in this country and thereby rendered their importation unnecessary. During the period 1561–1603 (42 years) 55 grants were made, of which 21 were to aliens, 30 to natives, and 4 for the regulation of trade (compare this with the number of Patents applied for in 1929, which was 39,927). The monopolies were in course of time sometimes found to act in restraint of trade by unduly interfering with existing industries. For example, Matthews's Patent of 1571 for making knives with bone hafts and plates of latten was upset on the plea that it interfered with existing industry. In this case, the Cutler's Company objected that the improvement was so slight that they ought to be free to use it without accounting to the Patentee. (Even at the present time a Patent can be upset if the invention is not a sufficient departure from the existing practice to constitute "invention," or in other words, a new manufacture or new process within the realm.)

The term "Letters Patent" means open letters—that is, not sealed up. During the Tudor period, the Crown, in some cases, carried on negotiations secretly, instead of by open letters, for the purpose of encouraging skilled foreigners to introduce new industries into this realm. Illegal grants and the abuse of the monopolies roused indignation. As bearing on the subject of the abuse of monopolies it may be mentioned that in Elizabeth's time such rticles as coal, salt, iron, bottles, glass, lead, oil, tin, and a number of other products were governed by monopolists who often abused their privileges. As an instance of this abuse may be mentioned the article salt which rose from 16d. to 15s. a bushel! Ultimately a bold step towards sweeping away the abuses was taken in 1624, when the Statute of Monopolies was enacted and the Crown was only allowed to grant certain monopolies, including those for new manufactures, which latter monopolies were granted for periods not exceeding 14 years. In order to cover England, Scotland and Ireland, in the old days, a separate Patent was required for each of these countries, the fees for the three totalling about £300, which amount, with professional charges, etc., was, in all probability, increased to an amount ranging rom about £500 to £700.

Sheriffs for County of London

Sir Ernest Benn Nominated

AT the ceremony, last week, of nominating the sheriffs of England and Wales for next year, presided over by the Chancellor of the Exchequer (Mr. Philip Snowden), the following were nominated for the County of London :

The Hon. A. Shaw, 24, Princes Gate, S.W.7.
R. Wallace, 57, Harley House, Marylebone Road, N.W.1.
Sir E. J. P. Benn, 2, Whitehall Court, S.W.1, Bt., C.B.E.

Nobel Prizes for Chemistry and Physics

THE Nobel Prize for Chemistry has been awarded to Professor Hans Fischer, of the University of Munich. The prize for Physics was awarded to Professor Sir C. V. Raman, of Calcutta, for his work on the scattering of light and the discovery of the effect, which bears his name.

Sir Chandrasekhara Venkata Raman, who is Palit Professor of Physics in Calcutta University, was born in 1888, was educated in the Presidency College, Madras, and entered the Indian Finance Department in 1907. In 1917 he was appointed Palit Professor in Calcutta University. He had held official positions in various bodies connected with the advancement of science in India, and was British Association Lecturer in Toronto and Research Associate of California Institute of Technology. In 1924 he was elected a Fellow of the Royal Society and was president of the Indian Science Congress in 1928. He conducts the *Indian Journal of Physics* and has published works on his experimental investigations of vibrations, molecular diffraction of light, and X-rays.

Public Health Congress and Exhibition

THE Public Health Congress and Exhibition was opened on Monday by Mr. Arthur Greenwood, the Minister of Health, at the Agricultural Hall, London, and remains open until to-day. Each day, morning and afternoon, there have been addresses by authorities on health questions and meetings of associations, including the Managers of Sewage Disposal Works, the British Waterworks Association, and the Institute of Public Cleansing.

Among the firms with stands at the exhibition are Bacterol, Ltd., Bell Brothers (Manchester, 1927), Ltd., Chloride Electrical Storage Co., Ltd., Dorr Co., Ltd., Industrial Waste Eliminators, Ltd., Monel Weir, Ltd., the Neckar Water Softening Co., Ltd., Soapless Foam, Ltd., the South Metropolitan Gas Co., Ltd., Wallace and Lerran, Ltd., Carl Zeiss (London), Ltd., Baker Perkins, Ltd., H. K. Lewis and Co., Ltd., Manlove Alliott and Co., Ltd., and the Paterson Engineering Co., Ltd.

German and British Dyestuff Prices

To the Editor of THE CHEMICAL AGE.

SIR,—I am rather astonished at Professor Green's deductions from the comparison of 1913 and 1929 export figures of dyestuffs from Germany, as stated in his letter in your issue of the 15th inst. Considering his position in the dyestuffs and scientific world, he should be scrupulously fair and accurate in making deductions, and in my opinion on this occasion he has not been fair to the German manufacturers.

I yield to no one in my admiration of the great and extraordinary progress of the British dyemaking industry, and have publicly expressed my views on this subject on many occasions. As a large user, I have no hesitation in stating that the price of British-made dyestuffs in the early part of the prohibition period was undoubtedly high, but by gradual stages this index figure has fallen from 400 to 160, taking pre-war as 100. To suggest, however, that the German index figure is to-day 238 by an arithmetical division of the weight of exports into the value is a sheer travesty of the facts. The index figure of the dyestuffs which my Association buys from Germany compares quite favourably with the British index figure.

It is a fact that the actual price, as reflected in the average price per lb. of German imported dyestuffs, is nearly three times pre-war, but this is entirely due to the fact that we import only specially high-priced colours, in consequence of the demand of the British public for much faster and better dyes than those used pre-war, whereas before the war the bulk of the imported colours were of the cheaper types.

A proper comparison can only be made by comparing like with like, and if Professor Green cares to examine the British prices of their wide range of the faster and better types of dyes, with the pre-war imported average price, he will find a similar disparity.—Yours, etc.,

H. SUTCLIFFE SMITH,
Chairman, Colour Users' Association.

Manchester,
November 17.

Institute of Chemistry Activities

To the Editor of THE CHEMICAL AGE.

SIR,—Your article on the recent activities of the Institute of Chemistry appearing in your last issue was of great interest to all chemists. From your article I gather that the aim of the Institute is to obtain "a supplementary charter with the object of securing a title to distinguish chemists, as represented by the Institute, from pharmacists." May I be permitted to suggest that a charter of this kind will help the profession of chemistry very little? There are a large number of efficient and fully qualified chemists who are not members of the Institute, but of other societies who certainly have an interest in this matter and should be consulted.

In unity there is strength. If all the professional chemical societies can combine on this matter of the Poison Legislation there is some hope of obtaining a general distinguishing title. The British Association of Chemists has long been agitating for some legal definition of the term "chemist" and the necessity and desirability of registration.

The individual chemist can only hope that the councils of the various societies will be large-minded enough to sink private differences of policy and at this critical juncture unite to approach the Government on the desirability of "representation on the central authority or board for the preparation of the Poison List," in view of his intimate connection with the poisonous drugs and chemical trade in the processes of manufacture, analysis, and research.—I am, etc.,

"A MEMBER OF ANOTHER SOCIETY."

British Road Materials

To the Editor of THE CHEMICAL AGE.

SIR,—Mr. Arthur E. Collins's plea in your issue of the 8th inst. for the use of tar on our roads in preference to other materials is based on the contention that we must at all costs support the gas industry by purchasing its by-product, tar, irrespective of whether or not it is the best material for the purpose required. But is it sound policy thus artificially to stimulate one British industry at the expense of another? And why single out the gas industry for this preferential treatment? We might with equal justice inaugurate a campaign for rubber roads in order to assist the British rubber producers.

England's industrial supremacy has been built up by allowing the free play of economic forces and by allowing the extent of the use of each product to be dictated by the service it can offer. When other road materials can offer a better service than tar, their use should be freely open to all who require them, without secondary considerations of the sort Mr. Collins brings forward. If such arguments had been allowed to prevail in the past, we should still have sailing ships and horse 'buses.—Yours, etc.,

LEONARD A. RICH.

November 15, 1930.

Food Fumigation with Hydrogen Cyanide

Increasing Use for Destruction of Insects

A REPORT on the effect on foods of fumigation with hydrogen cyanide has been prepared by Dr. G. W. Monier Williams, of the chemical laboratory of the Ministry of Health, and has just been published by H.M. Stationery Office, price 6d. There is an increasing use of hydrogen cyanide for the fumigation of foods liable to be infested with insects. If the process is skilfully applied, and due precautions are taken to prevent excessive absorption of gas, it would seem, states the Report, that no serious risk to health is likely to be involved. It is, however, emphasised that indiscriminate treatment of food with hydrogen cyanide by inexperienced operators may be fraught with real danger, not only to themselves in the application of the gas, but to the eventual consumer of the food. This Report gives definite guidance as to the limits within which fumigation of food may be regarded as free from risk to the consumer, and indicates certain foods in respect of which special care should be taken.

It has been found that the amount of hydrogen cyanide absorbed and retained by foods is influenced mainly by the strength of the gas and duration of fumigation; the moisture content of the food; the state of subdivision of the food; the method of packing; and the period of subsequent ventilation. Foods treated with not more than 1 vol. of HCN in 200 vols. of air and subsequently exposed to air, do not usually retain more than 20 parts of HCN per million. Special care is advisable with certain foods and also when higher concentrations of gas are used.

Hydrogen cyanide may be retained by foods containing laevulose, with which it forms a cyanhydrin. There is no evidence of the formation of dextrose cyanhydrin in fumigated foods unless the food is alkaline. Potassium cyanide, as distinct from hydrogen cyanide, rapidly disappears in foods containing dextrose or laevulose. Over-treatment with hydrogen cyanide may cause serious damage to fresh fruit and vegetables, owing to interference with the natural processes of respiration. Fumigation with hydrogen cyanide appears to have no permanent effect on bacteria or moulds.

Relation of the Chemist to Industry

DR. E. F. ARMSTRONG, F.R.S., spoke on Monday night at the University College of Hull on "Changes Ahead: the Relation of the Chemist to Industry." There was, he said, no business to-day whose welfare was not bound up with chemistry. While his discoveries might render machinery and even certain materials obsolete and valueless, the chemist invariably improved and cheapened the cost of the product itself. This was the only way to effect such cheapening, and to guard against competition; it was futile to meet it by cuts in wages, still more disastrous in the long run to do so by manipulating the value of money. In this respect, the financial experts had led the world badly astray the last few years.

The field within which the chemist worked was as broad as all industry. Everything was a chemical compound of some kind or other, and it could therefore in time be produced synthetically. The chemist had come to our rescue, and in the new age, with his help, Britain could go a long way towards making itself independent. He could give us fertilisers so that more food was available, and make many solvents, and, as he learned more of alloys and found out how to extract even the rarest of elements, he would be able to give definite help to the engineer.

"Account Rendered": A New Book by Sir Ernest Benn

WHEN Sir Ernest Benn wrote *The Confessions of a Capitalist* he set a new fashion in the literature of political economy. An autobiographical analysis of his own position as a citizen and an employer, tested for efficiency by comparison with the whole economic machine, was something that had not before been attempted. It brought the author into the front rank of critics of the effect of State action upon public well-being. Now, in *Account Rendered* (1900–1930), published on Friday,* the argument is taken up from a new point of view. The book is described as " an attempt to estimate the moral and material cost of the new ideas expressed in the political activities of Great Britain " during the period roughly extending from 1900 to the present day. This task the author performs with the simplicity and directness that we might expect, but, in addition, with an appreciation of historical and moral factors that makes it especially interesting at the present time.

Sir Ernest Benn has not receded one inch from the strictly individualist attitude revealed in his previous works. He is still an unyielding opponent, not only of the direct Government control of industry, but also of what in his view is as bad, the indirect interference of politicians in the conduct of trade. But whereas in former writings he has been inclined to argue particularly its detrimental effect upon the conduct of business, in *Account Rendered* he seeks to show its threat not to commerce alone, but to the whole of our British civilisation.

Mistaken Faith in Government

At the beginning of the present century the wave of aspiration for a new social order that began to surge high in the late 'eighties and the 'nineties was first directed into legislative channels. In the author's view, the benefits, such as they are, attendant upon the politics of social reform developed in such a high degree since 1900 would have been provided in any event and in much greater measure by the normal development of private enterprise. As it is, in an attempt to rectify abuses already fast disappearing through the advance of productive efficiency, State action has become the talisman upon which the country tends more and more to pin its faith. " This generation," writes Sir Ernest Benn, " turns to Government as its grandfathers turned to God, and looks upon it as an ever-present help in trouble."

The result has been the creation of a new vested interest, the bureaucracy of civil servants required to administer and operate the plethora of Acts, orders, and regulations whereby the new politics strives desperately to keep up with the growing social muddle of its own creation. Act follows upon Act in a vain effort to rectify the worsened conditions brought about by preceding instalments of restrictive regulation. In the process the country's industries undergo slow strangulation, the burden of taxation becomes well-nigh unendurable, and social collapse looms ominously ahead. As legislation engulfs more and more the activities of private individuals, as trade is hampered and cash distributed with less and less discrimination in the form of doles and subsidies, the community is steadily deprived of the only effective antitoxin that it possesses—the independence of spirit in the great mass of the people. Employers and workmen alike cease to rely upon their own resources as individuals, and turn increasingly to the very cause of their troubles for help.

Posterity, Debtor to Politics

It is time, then, declares Sir Ernest Benn, that the account for all this waste, confusion and muddle was made up. It is easy, of course, to dismiss the picture drawn in *Account Rendered* as alarmist. Such a comforting retort to the argument would do well enough were the author's case not supported at every point by unpleasant but incontrovertible facts drawn from the present situation. The new Agricultural Marketing Bill, quoted in full as an appendix and closely analysed as a sample of modern legislation, is sufficiently disconcerting in itself. The bill—the account rendered, " Posterity, debtor to Politics "—is an equally unpalatable fact. Future generations will have to meet it in full and while (in these days when people talk with easy assurance in millions of pounds) we jog along restfully supposing the national indebtedness to be a National Debt in the neighbourhood of £7,000,000,000, the burden that we are laying on our children's backs, Sir Ernest Benn argues, is really nearer to £20,000,000,000. Some of the ways in which it has reached this figure are graphically illustrated in Chapter XI. There the author cites with the fullest possible detail the concrete case of thirty years' growth in the official expenditure and staff of a typical rural district. Multiply the example there given by the number of similar authorities throughout the country, and there is proof enough that the author's alarm at the present state of affairs is only too well founded.

Happily the picture painted by Sir Ernest Benn is not one of unrelieved gloom. Throughout *Account Rendered* he displays an unwavering faith both in the fundamental soundness of Parliamentary democracy and in the ultimate capacity of the electorate, now numbering thirty millions of men and women, to appreciate the truth. The people still have time, he thinks, to trim the sails both of the politicians and of the bureaucracy if only the issues with which the nation is confronted are placed fairly and squarely before them. The times are serious, the perils great, but the writer refuses to abandon his belief in the orderly instincts and underlying common sense of the average Briton, national attributes so conspicuously displayed by all classes in the nineteenth century. His comparison of ourselves with the Victorians is, indeed, of special relevance and interest at the moment, when amid our present discontents men's minds turn wistfully to the Victorian era as a kind of Augustan age of peace at home and prosperity abroad.

Account Rendered is a book that everyone ought to read—above all that great part of the community responsible for the conduct of the country's trade and industry, those who pay the piper but seldom succeed in calling the tune. There are several valuable appendices, the best of them being, perhaps, the striking parallels with our own position drawn from the Roman Empire in its decline. The argument of the book might almost be summarised in the question, " Must Britain travel the Roman road ? " Sir Ernest Benn would answer, " No, if we will be warned in time."

*Account Rendered (1900–1930). By Sir Ernest J. P. Benn. Ernest Benn, Ltd. 6s. net.

China Clay Co.'s Appeal Dismissed

THE Devon Quarter Sessions Rating Appeals Committee was engaged for two days at Exeter on Friday, November 7, and Monday, November 10, in hearing the appeal of the North Devon Clay Co., Ltd., Torrington, against the assessment of their works at Petersmarland, Petrockstowe and Merton, by the North Devon Assessment Committee. For the appellants, Mr. Marshall Freeman said the original assessment on January 26, 1929, was thus divided—Petrockstowe, £798 ; Petersmarland, £717 ; and Merton, £2,173 ; but these were reduced by the Assessment Committee the following month to £559, £717 and £1,761 respectively. It was against these latter figures that the appeal was brought.

In his evidence, Mr. Arthur Body, a Plymouth surveyor and valuer, stated that within a radius of one mile in Cornwall was found all the china stone in the British Empire, and there was therefore a monopoly, and ball clay was found only in three places in the British Empire—in North and South Devon and Dorset.

The appeal was dismissed with costs against the appellants.

Leeds Fireclay Co., Ltd.

PRESIDING at the annual meeting of the Leeds Fireclay Co., Ltd., at Leeds, on Monday, November 10, Mr. Charles F. Spencer (chairman) said the continued selection of their materials for important contracts at home and abroad was a gratifying testimony to the high quality of their products, and the volume of the company's business as a whole had not been materially affected by the appalling economic conditions at home. With regard to Coal Conversion, Ltd., as the plant was not fully installed in time for last winter's season, it was not possible to begin the sale of smokeless fuel until the present season. The fuel produced—" Colconite "—was entirely satisfactory, and not only was it suitable for use in open grates, but it could be used with great advantage and economy il anthracite and other closed stoves. Testimonials from high authorities spoke of the fuel as the best on the market.

British Dyes Production Costs

An American Analysis

In a general review of the British dyestuffs industry by Mr. W. E. Moessner, U.S. Vice-Consul in Manchester, it is estimated that the cost of raw materials used by the British dyestuffs industry represents about 54·7 per cent. and wages 16·3 per cent. of the selling value of the output, leaving 29 per cent. for other operating expenses, taxes, depreciation, interest on outstanding obligations, profits, and dividends on capital account.

As near as it is possible to estimate, it appears that the total horsepower of prime movers available in those manufacturing establishments producing intermediates and finished coal-tar dyestuffs in the United Kingdom is 28,000, of which 10,000 represents reciprocating steam engines; 5,000, steam turbines; 5,000, internal-combustion engines; and 8,000 motors operated by purchased electricity.

Based on the percentages of the 1924 census and recent unsegregated figures of the Ministry of Labour for the chemical industry, it is estimated that the approximate number of persons directly employed in the manufacture of coal-tar dyestuffs is 11,500. Of this total, about 2,600 of whom are females, it is believed that perhaps 2,000 represent managerial, clerical, and technical staff, while the remaining 9,500 are employed in the actual production of dyes.

The weekly earnings of all male workers, both skilled and unskilled, including apprentices, in 1928 averaged £3 1s. 8d., and of female £1 5s. 4d. In comparison with several other British industries, there has been relatively little unemployment in dye-manufacturing establishments, partly in consequence of their rapid expansion.

Raw and Semi-manufactured Materials

In general, the bulk of the raw materials used for the manufacture of synthetic dyes is produced within the country, and a large portion of this output represents products of Imperial Chemical Industries. Yet foreign trade statistics reveal the fact that certain constituent and process chemicals used are imported in appreciable quantities, even though not solely consumed by the dye industry—for example, benzol, of which 4,800,000 imperial gallons are purchased abroad annually, chiefly from the United States.

Naphthalene is imported chiefly from Belgium and Germany, to the extent of about 5,376,000 lb.; anthracene, chiefly from Germany and France, about 1,904,000 lb.; phenol, chiefly from the United States, about 728,000 lb.; methanol, chiefly from Germany and the United States, about 500,000 gallons; acetic acid, chiefly from Germany, Czechoslovakia, and the Netherlands, about 16,000 tons; formaldehyde, chiefly from Germany, the United States, and Sweden, about 2,576,000 lb.; crude glycerine, chiefly from Belgium, the Netherlands, and Germany, about 5,600,000 lb.; and sulphur, chiefly from the United States and Italy, about 93,000 tons annually.

In 1927 the consumption of methanol by British dye makers amounted to 72,099 gallons, and in 1928, 78,644 gallons.

Quite a large number of British companies are manufacturers of intermediates used in the production of finished dyes, and such firms produce nearly the whole of their domestic requirements. Imports of intermediates, including aniline oil and salt and phenyl-glycerine, fluctuate considerably, but the peak of the past six years was reached in 1929, as will be seen from the following figures:—

(Quantity in lb.)

Year.	Quantity	Value	Year	Quantity	Value
1924	72,576	£8,587	1927.....	76,384	£8,100
1925	147,728	12,705	1928.....	94,864	8,067
1926	38,640	4,033	1929.....	208,208	24,503

Germany supplies three-fifths to two-thirds of these imports.

Imports of Alizarine and Finished Dyestuffs

There is no doubt that since the advent of the British Dyestuffs Act of 1920 a great industry has arisen, even though imports continue to be of considerable importance. Although prior to 1929, imports of alizarine dyestuffs recorded rather a steady decline, from 3,377,472 lb., valued at £226,283, in 1924, to 98,448 lb., valued at £34,183, in 1928, imports of finished dyestuffs other than alizarine and indigo showed a tendency to remain at around 4,500,000 lb. In 1929, however, imports of both alizarine and other dyestuffs increased, as will be seen from the following table:—

	Alizarine.		Other coal-tar dyes.	
Year.	Quantity.	Value.	Quantity.	Value.
1924	3,377,472	£226,283	4,554,256	£1,190,210
1925	1,243,312	74,352	3,194,912	572,551
1926	179,424	66,418	4,034,688	806,835
1927	115,696	34,186	4,536,672	987,291
1928	98,448	34,183	4,591,888	965,773
1929	190,400	59,851	5,486,656	1,037,520

The year 1929 was the best year for exports of intermediates and dyestuffs.

British Chemical Exports to China

Share in Two Important Groups

There was a heavy decline in British exports of the group of chemicals including caustic soda, soda ash and other preparations of soda, glycerine, spirits of wine, commercial alcohol, acids and ammonia, to Shanghai during 1929. The total trade was 15 per cent. lower than in 1928, but Britain's share declined by 41 per cent. so that she now takes second place to Germany. Germany has 25 per cent. of the trade, Great Britain 21 per cent., and Japan 17 per cent. The share of the United States, although only 10 per cent. of the total trade in 1929, represented an increase of 25 per cent. over 1928.

Imports of indigo into Shanghai—through which the bulk of such shipments to China passes—last year showed a 39 per cent. gain over the 1928 figure, and in this section Britain had a very fair share of the increase. The gross imports by countries of origin, during the two years were:

	1928 Pounds	1929 Pounds
Great Britain	2,842,133	4,160,266
Japan	966	266
Germany	18,772,533	22,789,200
France	421,733	1,721,333
United States	8,307,066	12,752,266
Switzerland	2,719,466	3,262,800
All others	412,286	152,602
Total	33,476,183	44,838,733

Exports of Red Oxide of Iron from Malaga

Total shipments of ground red oxide of iron from Malaga during the second quarter of 1930 amounted to 4,014 metric tons. The United States took 1,375 tons, while Great Britain was the second largest purchaser, receiving 817 tons. Other principal buyers were the Netherlands, Argentina, Belgium and Germany. Exports of crude oxide for the same period totalled 3,275 metric tons and were consigned chiefly to Great Britain, France, Belgium, Germany and Italy. No new markets for ground red oxide have been opened, and the total volume of trade with established markets so far this year has been about the same as in 1929, although in exports to the United States in the first half of this year there was a decrease of 240 tons. Shipments of crude ore have fallen off, particularly to Germany, total exports for the first six months of 1930 showing a decrease of nearly 3,000 tons.

Tung Oil Development in South America

Considerable interest, according to United States reports, is being manifested in Sao Paulo in the production of tung oil, and arrangements have been made for procuring tung oil seeds through the Japanese consulates at Sao Paulo, and cultivation of the trees will be commenced shortly throughout the State. The State agricultural authorities are of the opinion that the soil and general climatic conditions of the country are favourable for developing a tung oil industry.

United States imports of tung oil reached an extremely high figure during August amounting to 21,936,792 pounds, as against 9,608,508 pounds for the corresponding month of 1929. For the first eight months of 1930 the receipts of oil reached 102,917,889 pounds, in comparison with 77,338,662 pounds, for the same period of last year.

Right to the Trade Mark "Notox"

Judgment Against American Company

In the Chancery Division on Wednesday and Thursday, Mr. Justice Luxmoore had before him a question as to the registered trade mark "Notox." It came before the Court on the motion of Inecto (Incorporated), an American company, by way of appeal from the decision of the Assistant Comptroller of Trade Marks allowing the application of Notox, Ltd., to register the word "Notox" as their registered trade mark in class 48, in respect of shampoos and hair dye.

Mr. Whitehead, K.C., for the appellants, Inecto, Ltd., said the registrar held that the mark "Notox" was inherently distinctive in so far as it possessed one of the essential particulars, and that there had been some user or mark by Notox, Ltd., prior to the date of application. He also took the view that the facts which Inecto brought to his notice did not disturb the right of Notox, Ltd., to have the word "Notox" registered. There was at one time upon the register the word "Notox" which had been registered by a Mrs. Ducker, who assigned the trade mark to Notox, Ltd. Inecto Incorporated applied for registration in their own name of the word "Notox," and the Assistant Comptroller refused the application. From 1923, when the Inecto Co. was incorporated in the United States, to the date of the application by Notox, Ltd., the word "Notox" had been used by Inecto Incorporated in the United States.

His lordship inquired what the word "Notox" meant.

Mr. Whitehead said it had some reference to the phrase "non-toxic." In February, 1924, Inecto registered the word "Notox" in the United States. In 1927 Notox, Ltd., was registered as a company in this country.

Mr. Moritz, K.C., for the Notox Co., pointed out that that company had been in being from May, 1927, and there was evidence that it was selling small but appreciable quantities of the article.

His lordship, in giving judgment, said in his view user of the word "Notox" in the United States and foreign countries was really of no assistance here, and he was satisfied that evidence under this head was really irrelevant. Neither did he think that publication in United States journals of the word "Notox" came to the knowledge of traders in England. In his view the Notox Co. had discharged the onus upon them by showing no likelihood of deception, and he came to the same conclusion as the Registrar. He dismissed the motion with costs.

Japanese Soda Ash Plants

The Asahi Glass Co. and the Japan Soda Industry Co., the only two manufacturers of soda ash now operating in Japan, are planning increases in their output, while the South Manchurian Railway is expected to build a soda ash plant. Present production of the first two firms is respectively 80 and 100 tons daily. That of the Japan Soda Industry Co., being Government subsidised, is to be increased soon to 150 tons per day and some of this increase is to be used for caustic soda production. About 60 per cent. of the soda ash in Japan is used for glass manufacture, 10 per cent. for soap, and the rest chiefly for caustic soda and the rubber industry. Consumption of soda ash in 1927 totalled over 121,000 tons, and in 1928, over 107,550 tons, of which 77,110 tons was imported and 30,439 tons produced locally. In 1929 production figures are not available, but imports equalled those of 1928.

Dominion Water Power and Hydrometric Bureau

The Dominion Water Power and Hydrometric Bureau of the Department of the Interior of Canada has recently issued volume 62 of the Water Resources Papers, which deal with the surface water supply of Canada. This number contains the results of investigations made by the Dominion hydrometric survey during the climatic year October 1, 1927, to September 30, 1928, in the provinces of Alberta, Manitoba, Saskatchewan and Western Ontario.

The report contains a short explanation of the purpose and scope of the work, and 202 pages of stream flow and meteorological data, with an index map showing drainage areas and the location of the gauging stations. Copies may be obtained free of charge on application to the Director of the Dominion Water Power and Hydrometric Bureau, Ottawa, Canada.

Problems in Lead Refining

Behaviour of Antimony Oxide

Studies of the vapour pressures and other fundamental thermo-dynamic properties of the oxides of lead and antimony conducted at the Pacific Experiment Station of the United States Bureau of Mines, in co-operation with the University of California, have brought to light certain apparent anomalies in the behaviour of antimony oxide during the process of lead refining. In this process the antimony in impure lead is customarily oxidised by the action of air on the molten metal. In certain circumstances the coating or "skim" of oxides so obtained fails to volatilise the antimony, but if carbon or reducing agents be later added, volatilisation of the antimony as oxide occurs at temperatures only slightly higher. This phenomenon cannot be explained on the basis of the volatility of reduced metallic antimony, which has a negligible vapour pressure at the temperatures ordinarily used for the process.

In order to throw some light upon the behaviour, further experiments have been carried out to determine the melting points of mixed lead and antimony oxides and their vapour pressures in the solid and liquid states. These determinations indicate the formation of certain compounds between lead oxide and antimony oxides. When the antimony is in the lower state of oxidation, these compounds have low melting points, but prevent vaporisation of the antimony. When the materials are heated in air, however, compounds of antimony in a higher state of oxidation are produced, which are infusible below 1,100° C., and which are also without vapour pressure. These compounds are difficultly reducible, and may be an important factor in the treatment of "skims" produced in lead softening.

Joint Chemical Meeting at Newcastle

Members of the Newcastle section of the Society of Chemical Industry, with their chairman, Dr. J. T. Dunn, and members of the Chemical Engineering Group paid a joint visit on Monday, November 14, to the Carville Power Station of the Newcastle Electric Supply Co., Ltd. Subsequently a joint meeting was held in Armstrong College, when a paper on "Caustic Embrittlement" was read by Mr. W. S. Coates, A.M.I.Chem.E.

It had been realised in recent years, said the author, that the indiscriminate use of chemicals to prevent scale on the heating surface was liable to do considerable damage to the boiler metal. This was an age of efficiency and economy, and now that boilers worked up to a pressure of 800 or 1,000 lb. per sq. in., great care was obviously necessary in connection with the softening of the water used in them. The methods available for ensuring the safe working of modern high-pressure boilers in the light of recent research, and the factors that need to be watched carefully, were outlined.

The meeting was followed by an informal dinner in the University Union, when cordial thanks for his past services were extended to Mr. Hirsch, who has been succeeded as hon. secretary of the section by Mr. J. W. Craggs.

New Local Sections of Institute of Fuel

The North-Western Section of the Institute of Fuel has now been formed, and will hold meetings periodically at the Engineers' Club in Manchester. The area covered by the section comprises Cumberland, Lancashire, Cheshire, North Wales, a little of Yorkshire (including Huddersfield and Halifax), and the Buxton district of Derbyshire. The Section is holding its next meeting on December 9, when Mr. Ivor David will read a paper on private generation of electricity *versus* the grid.

At its meeting in London on November 12, the Council of the Institute sanctioned the formation of the East Midlands Section, which is now in being. This Section comprises the whole of the county of Derbyshire except the Buxton area, the counties of Nottinghamshire, Lincolnshire, Rutland and Leicestershire, and that portion of Northampton north of Kettering. A meeting is to be held in Derby on December 12. The Institute hopes to increase the number of sections in the provinces during the coming year by at least another three or four.

From Week to Week

DR. F. G. BANTING, the discoverer of insulin, has received an honorary Fellowship of the Royal College of Surgeons.

A CHEMICAL WORKS MANAGER is required to improve product, reduce cost and increase output, of an old-established chemical works. Further details of this post will be found in our advertisement columns.

OWING TO PRESSURE of other duties, Sir Henry Strakosch has resigned his seat on the board of the British Enka Artificial Silk Co., of which he was chairman, and Mr. Cyrus Thomas Pott has been elected a director in his stead.

THE FEDERATION OF BRITISH INDUSTRIES is moving its London headquarters from 39, St. James's Street, to its new building at 33, Tothill Street, Westminster, on or about December 15, in order that the organisation may be installed before the Christmas holidays.

FOLLOWING the burning of the boots and clothing of a number of Kilmarnock children last week, the police discovered that a lorry carrying a tank of vitriol had passed through two streets of the town, and was the cause of a stream of vitriol in the streets where the children had been playing.

THREE FATAL ACCIDENTS occurred in chemical works in Great Britain and Northern Ireland during October, out of a total of 64 fatalities in all industries. There were also two cases of chrome ulceration reported from dyeing and finishing work and one from chrome plating, and three cases of aniline poisoning.

NEGOTIATIONS are in progress for a full merger of two large German mining companies, the Hoesch Iron and Steel Works Co. at Dortmund, and the Köln-Neuessen Mining Union at Essen, between which a community of interests was concluded in 1920. Details of the fusion, which is planned for reasons of economy, are not published so far, and final decisions are to be taken at the board meetings of the companies to-day.

THE FOLLOWING have been elected Fellows of the Physical Society: Roger Daniel Hewart Jones, Robert Stephen Dadson, George Paget Thomson, Syed Mohamad Ali Khan, Herbert John Gough, Thomas Musgrave Pyke, R. F. Hanstock, R. S. Mani, P. V. Kuruvila, H. R. Robinson, H. Amorim Ferreira, Louis George Melio, Donald Thomas Jones, and H. Harrison Macey. The Council have elected E. R. F. P. Mendis a Fellow of the Physical Society under Article 14.

IN VIEW OF RECENT DEFECTIONS, it is not anticipated that the remaining members of the acetate artificial silk convention will continue to adhere to the terms of the agreement. The German producers, the Aceta Co., belonging to the I.G. Farbenindustrie (German Dye Trust) and the Deutsche Rhodiaseta Co., have lowered their prices to 10 per cent. below the convention prices, and following their example, the Belgian concern, Fabrique de Soie Artificielle de Tubize, has also lowered its prices, and is understood to have definitely withdrawn from the convention.

UNIVERSITY NEWS: *Manchester*.—Dr. J. E. Myers, Senior Lecturer in Chemistry, has been appointed Assistant to the Vice-Chancellor, and Mr. J. M. Preston, B.Sc. (Liverpool), Assistant Lecturer in Textile Chemistry. *Sheffield*.—The Council have made the following appointments: Mr. Eric Seddon, B.Sc., Ph.D. (Leeds), as Research Physicist in the Glass Department; Mr. W. Maskill, B.Sc. (London), as temporary Junior Research Assistant in Glass Technology; Mr. Eric Preston, B.Sc. (Birmingham), and Mr. S. C. Waterton, B.Sc. (London), as Research Fellows in the Glass Department.

"METALS AND ALLOYS OF THE FUTURE" was the subject discussed at the Birmingham Chamber of Commerce at a meeting of the Co-ordinating Committee, representing the Staffordshire Iron and Steel Institute, the Birmingham Metallurgical Society (Inc.) and the Birmingham Local Section of the Institute of Metals. Dr. W. H. Hatfield, of Sheffield, who introduced the discussion, expressed the view that, except for a few very special purposes, the pure metals would not be so important as the range of new alloys which would no doubt be developed. He thought the new alloys of the future would be based on either iron or aluminium. Already the alloying of chromium to iron had produced rustless steel, and, as regards aluminium, great strength could now be obtained with great lightness.

MAY AND BAKER, LTD., of Battersea, London, announce a reduction in their prices for citrates, and an advance in the price of bismuth salts by 1s. per lb. on carbonate.

EMPLOYEES of the chemical works department of Glasgow Corporation have subscribed over £136 for local charitable institutions during the current year, and a similar amount is to be contributed by the Department.

MR. FRANK EASTMAN, chairman and director of Associated Dyers and Cleaners, Ltd., has resigned his position, and Mr. J. W. Murray, of 5, Waterloo Street, Birmingham, has been elected a director of the company and also chairman of the board of directors.

THE HOME SECRETARY has appointed a Departmental Committee to inquire and report whether, and, if so, subject to what conditions, the schedule of industrial diseases under the Workmen's Compensation Act, 1925, can properly be extended to include poisoning by turpentine.

MR. HAROLD NIXON has been elected chairman of directors of Ayrton, Saunders and Co., Ltd., manufacturing chemists, Liverpool, in succession to Mr. W. H. Saunders, who died at Rangoon, Burmah, on October 28 last. The new chairman joined the firm in 1898, and was appointed to the directorate in 1908.

IN THE CHANCERY DIVISION on Friday, November 14, Mr. Justice Bennett granted Lever Bros., Ltd., an injunction for a week to restrain L. B. Products, Ltd., of Camden Town, from selling or offering for sale their goods in such a manner as to lead the public to suppose that the goods were manufactured by Lever Brothers.

THREE HUNDRED AND FIFTY STUDENTS, chiefly from the oxy-acetylene classes of the Manchester, Liverpool, Crewe, Bacup, Bradford, Leeds, and Birkenhead Technical Schools, visited the works of the British Oxygen Co. in Trafford Park on Saturday, and witnessed the factory production of such gases as oxygen, hydrogen and nitrous oxide, and some of their industrial applications.

AT THE MONTHLY MEETING of the Oil and Colour Chemists' Association, held at the Institute of Chemistry, Russell Square, London, on Thursday, November 13, the President (Mr. Noel Heaton) announced that Mr. R. P. Britton had been compelled through pressure of other work to resign the hon. secretaryship. The Council had accepted this resignation with great regret, and Mr. Forrest Scott had agreed to carry on the duties for the remainder of the session.

AN AGREEMENT, it was announced on Monday, has been signed between the Polish Minister of Finance, on the one hand, and the Polish Match Monopoly Co. and the Swedish Match Co., as guarantor for the Polish Co., on the other, providing for the extension of the term of the match monopoly by twenty years, until 1965, and the modification of the conditions of the agreement. The agreement also provided for a loan for a nominal sum of £6,480,000, bearing interest at the rate of 6½ per cent. per annum.

A GUIDE to the services of the Department of Overseas Trade has recently been issued in the form of a handy little booklet, with a foreword by Mr. G. M. Gillett. Traders, it is stated, have already made good use of the Department, but nothing like full use, and the booklet sets out the general and specific information on foreign markets and the inquiry, guarantee, and other commercial services which the Department has to offer. There are also lists of H.M. Trade Commissioners and Commercial Diplomatic Officers in various parts of the world.

MR. J. GUILFOYLE WILLIAMS, chief chemist of the analytical and testing laboratory of Selfridges, addressed the London Section of the Textile Institute on Monday and appealed for the establishment of a Textile Research Association to investigate standards of descriptions such as "fadeless," "fast colour," "unshrinkable" and "rainproof." "In the course of my duties," he added, "I test many alleged 'fadeless' furnishing fabrics, and I find that about 20 per cent. of those offered as 'fadeless' are certainly not 'fadeless,' even to a most tolerant definition of the term. In regard to 'fast colour,' the position, again, is unsatisfactory."

Obituary

M. JOSEPH HAVRANEK, Prague, deputy managing director of the Skoda Works, aged 58.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

335,169. DYES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 16, 1929.

Azo dyes containing groups such as sulphonic, carboxylic, or sulphamide groups which induce ready solubility are treated with agents yielding chromium in the presence of an organic base to obtain new chromium compounds, and others previously obtainable only in acid or alkaline solution. The azo dyestuff may be produced, and the chromium compound obtained, in a single operation. In an example, the dyestuff 4-sulpho-2-amino benzoic acid→3-methyl-5-pyrazolone is heated under pressure with chromium chloride and pyridine in aqueous solution to obtain a product which dyes wool yellow. Other examples describe the chromium compounds of the dyestuffs 4-chloro-2-amino-phenol-6-sulphonic acid→1-phenyl-3-methyl-5-pyrazolone, 4-chloro-2-amino-phenol-6-sulphonic acid→2 : 4-dioxy-quinoline, 5-nitro-2-amino-phenol →2 : 5-naphthylamine sulphonic acid, 1 : 2-amino-naphthol-4-sulphonic acid → 1 : 8-naphthol sulphonic acid, 1 : 2-amino-naphthol 4-sulphonic acid→1-phenyl-3-methyl-5-pyrazolone, 1 : 2-amino-naphthol-4-sulphonic acid → 1-(4¹-sulpho) phenyl-3-methyl-5-pyrazolone, and others.

335,175. FERTILISERS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 15, 1929.

Granular non-hygroscopic fertilisers are prevented from caking by coating the granules with non-volatile mineral or other oil which is insoluble in water and may contain a water repellant material such as wax, paraffin, or fat. The treatment may be applied to urea, potassium chloride-ammonium nitrate, or mixtures with ammonium phosphate, ammonium sulphate nitrate, mixtures of ammonium nitrate with calcium carbonate, etc.

335,215–6–7–8. DESTRUCTIVE HYDROGENATION. H. W. Strong, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, June 19, 1929.

335,215. Oil or a suspension of coal in oil is destructively hydrogenated in the liquid phase in the presence of a catalyst consisting of an extended surface such as iron or mild steel, coating with tin or nickel by dipping, spraying, or electrolysis. The vessel may be similarly coated. The catalyst is activated by a preliminary treatment which may remove part or substantially all of the coating metal, *e.g.*, by heating with acid or alkaline solutions such as a 5–10 per cent. solution of hydrochloric or nitric acid, or a 10 per cent. solution of caustic soda. The acid solution may be mixed with 5 per cent. of urea to form a surface layer of stannous hydroxide which is subsequently reduced. In an alternative, the plates may be immersed in molten sodium metaphosphate or borax at 900°–1000° C., and in another alternative tinplate is heated in a bath of paraffin oil or wax at 350° C., whereby most of the tin is alloyed with the iron. The activated catalyst may be subjected to a stream of moist hydrogen at 500° C., and a pressure up to 200 atmospheres. An example is given of the hydrogenation of mineral oil with these catalysts at a temperature of 450° C. and pressure of 250 atmospheres.

335,216. Catalysts such as those described in Specification No. 335,215 above, are employed in the destructive hydrogenation of oils in the vapour phase, the amount of hydrogen employed being 1,000 to 3,000 cubic metres per ton of oil. In an example, preheated gas oil is vaporised, mixed with hydrogen, and passed into a reaction vessel, packed with tin-plated iron rings, at a temperature of 448° C. and pressure of 150 atmospheres, the unconverted gas-oil being recirculated. A yield of 52 per cent. of petrol boiling up to 200° C. is obtained. The yield may be increased to 73 per cent. by employing a temperature of 453° C. and pressure of 200 atmospheres, while if nickel-plated iron is employed as a catalyst at a temperature of 470° C. and pressure of 250 atmospheres, a yield of 75 per cent. of petrol is obtained.

335,217. A catalyst for destructive hydrogenation of carbonaceous materials in liquid or vapour phase consists of tin alloys which are not molten at the reaction temperature, such as those with iron, copper, magnesium, or phosphorus. Suitable alloys are iron with 5 per cent. of tin, melting at 968° C., and gun metal containing 90 per cent. of copper and 10 per cent. of tin. These catalysts may be supported on a metal such as iron, or a steel containing 18 per cent. of chromium, 8 per cent. of nickel and 0·1 per cent. of carbon. The alloys may be employed in the form of plates, irregular pieces or granules.

335,218. A catalyst for the destructive hydrogenation of oil in the vapour phase consists of the combination of a massive metallic catalyst and a porous catalyst in pieces or layers of appreciable size. The massive catalyst may be iron coated with tin or nickel (see Specifications 335,215–6 above) or a metal such as tin, and a metalloid such as arsenic, antimony, bismuth, selenium, or tellurium, or alloys containing tin, as described in Specification No. 335,217 above. The porous catalyst may be ferric oxide, bog iron ore, or ferric oxide with 1·5 per cent. of aluminium oxide. These may be supported on pumice or magnesia, and may be reduced with hydrogen before use. The two catalysts may be used together or in separate vessels.

335,223. ESTERS. Canadian Electro Products Co., Ltd., 83, Craig Street West, Montreal, F. W. Skirrow, and G. O. Morrison, Shawinigan Falls, Quebec. Application date, March 18, 1929. Addition to 308,169.

Di-esters of carboxylic acids are obtained as described in Specification No. 308,169 (see THE CHEMICAL AGE, Vol. XX, p. 507) and any vinyl ester formed is returned to the reaction for conversion into the di-ester. In an example, an excess of acetylene is passed at 60°–80° C. through a mixture obtained by dissolving mercuric oxide in acetic acid and adding a precipitant made by adding sulphur trioxide to acetic acid. The reaction is effected under a reflux condenser which returns any vinyl acetate formed. The product is mainly ethylidene di-acetate. Some alternative examples are given of the preparation of the mixture through which the acetylene is passed.

335,232. ANTHRAQUINONE DERIVATIVES. W. Smith, J. Primrose, J. Thomas, and Scottish Dyes, Ltd., Earls Road, Grangemouth. Application date, April 15, 1929.

2-Methyl-anthraquinone is chlorinated in oleum of a strength below 20 per cent., at a temperature below 15° C. to obtain 1-chlor-2-methyl-anthraquinone. In an example, 4¹-methyl-2-benzoyl-benzoic acid is heated with oleum, a small proportion of iodine added, and chlorine passed through at 0° C. The 1-chlor-2-methyl-anthraquinone may be isolated by pouring into water, or the solution may be treated directly with oxidising agents such as manganese dioxide to obtain 1-chlor-anthraquinone-2-carboxylic acid.

335,280. 2 : 3-BUTYLENE-GLYCOL. T. H. Verhave, Postbox 1, Delft, South Holland. Application date, June 26, 1929. Addition to 315,263 (see THE CHEMICAL AGE, Vol. XXI, p. 244).

A mash containing a carbohydrate, a nitrogen compound, phosphate, and carbonate is subjected to the action of bacteria capable of producing 2 : 3-butylene glycol. After fermentation, the alcohol formed is distilled off, a further quantity of mash added, reinoculated and again subjected to fermentation. The 2 : 3-butylene-glycol and alcohol are then recovered. This process may be repeated at least once, or the alcohol formed may be distilled after the first fermentation and the residue used as a solvent in the preparation of a new mash.

335,297. DYES. G. B. Ellis, London. From Chemical Works, formerly Sandoz, Basle, Switzerland. Application date, July 6, 1929.

Hydroxylated azines or their derivatives are heated with alkali polysulphides in the presence of molybdenum or its compounds such as molybdic acid, alkali or ammonium

molybdates, or phosphomolybdic acid. The products are sulphuretted dyes giving brownish-red to violet shades, and the results are redder and clearer by using molybdenum than by using any other metal. The treatment of aminooxy-phenazine, aminooxy-tolazine, aminooxy-tolazine-carboxylic acid, dichlor-aminooxy-tolazine and ethosafraninone is described.

335,371. Treatment of Waste Lyes. E. L. Rinman, 14, Ymervägen, Djursholm, Sweden. International Convention date, July 15, 1929.

Soda or sulphate pulp waste liquor is treated with oxide or hydroxide of barium or strontium, mixed with those of calcium, magnesium, aluminium, zinc or iron, and with neutral substances, and dry-distilled. This may be done by evaporating to a non-sintering mass on rotary cylinders below 150° C. and then feeding through a cylindrical airtight furnace varying from 200° C. at one end to 600°–700° C. at the other end, where steam at 500° C. is introduced. The distillate comprises methyl alcohol, acetone, methyl-ethyl ketone, acetone oil, other heavy oils, and hydrogen, and is separated into oils and aqueous solution. The latter is treated to remove water and the concentrate purified. The residue is leached to remove soda, and then burnt to recover the hydroxides.

335,386. Destructive Hydrogenation. Naamlooze Vennootschap de Bataafsche, Petroleum Maatschappij, 3, Carel van Bylandtlaan, The Hague. International Convention date, November 7, 1928.

The catalytic material known as "luxmass" described in specifications 314,859 (see The Chemical Age, Vol. XXI, p. 224), and 335,513, which is mainly alkaline ferric oxide obtained in the purification of bauxite, is rendered more efficient in the destructive hydrogenation of coal by mixing with molybdenum or its compounds. An example is given of the hydrogenation of brown coal in the presence of "luxmass" and ferric molybdate.

335,391. Glycidic Acids. A. A. Kaufmann, 7, Avenue Léon Gaud, Geneva. Application date, October 8, 1929.

α-β-Unsaturated aldehydes are oxidised in alkaline medium by hypo-halites or by hydrogen peroxide. Thus, cinnamic aldehyde may be treated with an alkaline solution of sodium hypobromite to obtain the sodium salt of phenyl-glycidic acid.

335,394. Purifying Gases. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. International Convention date, October 23, 1928.

Hydrocarbons, water-gas, etc., are purified from sulphur compounds by passing at 650° C. over a contact mass comprising thorium or thorium compounds, *e.g.*, thorium oxide, with or without promoters such as magnesium oxide, lead oxide, copper or nickel. These may be precipitated on pumice, diatomaceous earth, or active carbon. The contact mass is regenerated by reducing or oxidising gases, such as steam, hydrogen or air.

335,411. Catalytic Apparatus. Holzverkohlungs-Industrie Akt.-Ges., Konstanz, Baden, Germany. International Convention date, November 28, 1928.

A reaction chamber for catalytic gas reactions is formed with two of its walls, which may be flat or curved, parallel to one another and relatively close together, but sufficiently separated to allow ready insertion and removal of the catalyst. A number of such chambers may be placed side by side in a heating or cooling chamber and may be connected together in any desired order.

335,421. Urea. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. International Convention date, November 13, 1928.

Carbon dioxide and ammonia are passed into transformer oil until a paste is formed containing ammonium carbamate and 50 per cent. of oil. The paste is then heated to 150° to 200° C. at a pressure of 100 atmospheres, yielding a mixture of urea, water, ammonium carbamate and oil, which is distilled under a reflux condenser. The unconverted ammonium carbamate is removed as ammonia and carbon dioxide, and the aqueous solution of urea is separated from the oil. Instead of employing carbon dioxide and ammonia, ammonium carbonate or carbamate may be used.

Note.—Abstracts of the following specifications, which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: 313,123 (I.G. Farbenindustrie Akt.-Ges.), relating to manufacture of hydrocarbons, see Vol. XXI, p. 136; 314,019 (A. Boehringer), relating to hydrogenated pyridine and piperidine derivatives, see Vol. XXI, p. 178; 315,664–5 (Soc. of Chemical Industry in Basle), relating to azo dyestuffs containing copper, see Vol. XXI, p. 266; 315,858 (A. M. Byers Co.), relating to slags for use in the manufacture of wrought iron, see Vol. XXI, p. 37 (Metallurgical Section); 316,149 (I.G. Farbenindustrie Akt.-Ges.), relating to purification of vat dyestuffs of the anthanthrone series, see Vol. XXI, p. 294; 316,550 (F. C. Palazzo and F. Palazzo), relating to monocalcium phosphate and mixtures of mono- and di-calcium phosphate, see Vol. XXI, p. 314; 316,950 (I.G. Farbenindustrie Akt.-Ges.), relating to derivatives of naphthazarin, see Vol. XXI, p. 337.

Specifications Accepted with Date of Application

316,274. Waste products from petroleum refining, Treatment of. I.G. Farbenindustrie Akt.-Ges. July 26, 1928. Addition to 299,086.

316,548. Working-up crude potash salts. Chemieverfahren Ges. July 30, 1928.

316,951. Condensation products from olefines and unsaturated hydrocarbons, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 4, 1928.

319,685. Concentration of fluorspar values from fluorspar ores. Aluminium, Ltd. September 26,1928.

337,349. Chromium or chromium-nickel steel alloys. F. Krupp Akt.-Ges. June 26, 1929.

337,368. Fatty acid derivatives, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). July 26, 1929.

337,394. Urea, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). July 29, 1929.

337,395. Pure sulphur, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). July 29, 1929.

337,401. Finely crystalline soda, Simplification of the manufacture of. W. Mann. July 30, 1929.

337,402 and 337,415. Fertilisers, Manufacture of. A. Holz and T. V. D. Berdell. July 30, 1929.

337,406. Sulphuric acid and nitric acid, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). June 13, 1929. Addition to 301,232.

337,407. Oxidation of hydrocarbons in the gaseous phase. H. Harter. June 24, 1929.

337,409–10. Oxygenated organic compounds, Manufacture of. H. Dreyfus. July 24, 1929.

337,434. Hydrocarbons, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). May 30, 1929.

337,460. Polymerisation of butadiene-1 : 3-homologues and analogues thereof. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). August 2, 1929.

337,471. Distillation of volatile metals, Apparatus for. E.M.S. Industrial Processes, Ltd., R. A. Stokes, and E. G. L. Roberts. August 3, 1929.

337,558. Light metal alloy. Birmingham Aluminium Casting (1903) Co., Ltd., and P. Pritchard. October 9, 1929.

337,562. Protecting iron and steel. A. Folliet and N. Sainderichin. October 10,1929.

337,563. Nitro-compounds, Manufacture of reduction products of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). October 10, 1929.

337,566. Acetone, Manufacture of. H. D. Elkington. (*Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij.* October 10, 1929.

337,577. Monoazo dyestuffs, Manufacture of. J. R. Geigy Soc. Anon. October 15, 1928.

337,609. Glycollic acid esters, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). November 8, 1929.

337,635. Cementation processes for ferrous metals. A. Folliet and M. Sainderichin. November 28, 1929.

337,636. Volatilisation of zinc ores and mixtures thereof. A. Folliet and N. Sainderichin. October 19, 1929.

337,671. Destructive hydrogenation of carbonaceous materials. Standard Oil Development Co. December 21, 1928.

337,680. Wire-gauze catalysers. C. Toniolo and Azogeno Soc. Anon. per la Fabricazione dell' Ammoniaca Sintetica e Prodotti Derivati. July 25, 1929.

337,715. Titanium steel, Production of. W. Mathesius and H. Mathesius. March 16, 1929.

337,374. Derivatives of the acridone series, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). April 26, 1929.

311,326. Purifying from naphthalene the distillation gases of coal. Gewerkschaft M. Stinnes. May 9, 1928.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Bloxam, A. G., and Soc. of Chemical Industry in Basle. Manufacture, etc., of cellulose solutions, etc. 34,339. November 14.

Boehringer and Soehne Ges. C. F. Production of acetic acid. 33,815. November 10. (Germany, November 15, 1929.)

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of 2-aroyl-1 : 9-isothiazoleanthrones. 33,929. November 11.

—— Manufacture of fast vat dyestuffs. 34,237. November 13.

—— Manufacture of acridine derivatives. 34,360. November 14.

Coles, S. O. Cowper-. Manufacture of red lead. 34,023. November 12.

—— Manufacture of zinc oxide. 34,024. November 12.

Du Pont de Nemours and Co., E. I., and Imperial Chemical Industries, Ltd. Production of glycols. 34,190. November 13.

Enderli, M. Producing formates of alkaline earth metals. 34,308. November 14.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of emulsions. 33,948, 33,949. November 11.

Henkel et Cie, Ges. Catalytically hydrogenating fatty acids. 33,813. November 10. (Germany, December 23, 1929.)

Hurrell, G. C. Emulsifying, mixing and disintegrating machines. 33,740. November 10.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Apparatus for carrying out pyrogenic conversion of hydrocarbons. 33,804. November 10.

—— Manufacture of organic compounds. 34,193, 34,194. November 13. (July 7.)

—— Manufacture of drying oils. 34,195. November 13.

—— Separation of unsaponifiable constituents from mixtures of fatty acids. 34,196. November 13.

—— Manufacture of polymerisation products. 34,197. November 13.

—— Manufacture of motor fuels. 34,198. November 13.

—— Manufacture of derivatives of polymerised aromatic compounds. 34,199. November 13.

—— Manufacture of discharge agents for printing textiles. 34,200. November 13.

—— Manufacture of acetaldehyde and acetic acid. 34,349. November 14.

—— Manufacture of polymerisation products. 34,350. November 14.

—— Treating fibrous materials, and preparations therefor. 34,351. November 14.

—— Manufacture of dimethylolacetone, etc. 34,352. November 14.

—— Treatment of solid carbonaceous materials under pressure 34,353. November 14.

—— Manufacture of styrene, etc. 34,354. November 14.

—— Manufacture of wax-like substances. 34,449. November 15.

—— Manufacture of hydroxyl-alkyl compounds. 34,450. November 15.

—— Manufacture of chrome pigments. 34,451. November 15.

—— Dyeing. 34,452. November 15.

I.G. Farbenindustrie Akt.-Ges. Drying, etc., moist high-grade neutral calcium hypochlorite. 33,819. November 10. (Germany, November 15, 1929.)

—— Continuous feed kinematograph apparatus. 33,951. November 11. (Germany, November 12, 1929.)

—— Projecting lenticular films. 34,072. November 12. (Germany, November 21, 1929.)

—— Manufacture of carboxylic acid derivatives of the anthraquinone series. 34,073. November 12. (Germany, November 16, 1929.)

—— Manufacture of dyestuffs. 34,359. November 14. (Germany, November 16, 1929.)

—— and Mond, A. L. Manufacture of wheels. 34,213. November 13.

Imperial Chemical Industries, Ltd. Manufacture of castable hard alloys. 34,345. November 14. (Germany, November 14, 1929.)

International Industrial and Chemical Co., Ltd. Production of barium oxygen compounds. 34,105. November 12. (Germany, February 17.)

Maclaurin, R. Obtaining ammonia chloride and organic compounds from ammonia liquors. 34,400. November 15.

Standard Oil Development Co. Destructive hydrogenation of solid carbonaceous materials. 33,771. November 10. (United States, November 13, 1929.)

—— Hydrogenation of carbonaceous materials. 34,060. November 12. (United States, November 20, 1929.)

German Chemists Sentenced

Secret Processes Betrayed

THE trial has just concluded at Düsseldorf of three chemists charged with betraying to foreign agents certain secret processes of the German chemical industry. The principal defendant, Dr. Buntrock, was sentenced to twelve months' imprisonment and fined £100; Dr. Jonsen to three months' imprisonment and fined £150; while judgment against Dr. List has not yet been pronounced.

During the case, counsel for one of the defendants asked a witness if he was aware that the I.G. Farbenindustrie did business abroad with its dyestuff patents, and that the Baden Aniline Works, one of the trust's subsidiary companies, had sold patents of great importance for the defence of Germany to foreign countries. He further asked if he knew that the I.G. Farbenindustrie was connected with a British group and an American oil company.

These questions caused counsel representing I.G. Farbenindustrie to protest that matters were being published which were the secrets of the Trust directors. At a later stage, the head of the Anti-Espionage Department maintained by the I.G. Farbenindustrie revealed that his department's card index contained the names of 18,000 foreigners who traffic in secret industrial processes.

The three accused chemists are all over 60 years of age. Dr. List and Dr. Jonsen maintained that they had furnished Dr. Buntrock with formulæ, to which they had access, for publication only in the technical journal which he edited. Dr. Buntrock, however, appears to have sold them to a German-American named Guido Meissel, of Portsmouth, United States. Meissel, with two other men, was sentenced to a term of imprisonment at Düsseldorf in 1928. At that time Dr. Buntrock was "wanted," but fled to Czechoslovakia. He was arrested in Germany this year.

Niger Co. Officials' Appeal Dismissed

THE Court of Appeal—composed of Lords Justices Scrutton, Lawrence and Greer—on Monday dismissed the appeal by Mr. Ernest Hyslop Bell, of Granby Hotel, Harrogate, and Mr. Walter Edward Snelling, of St. Ronans, Putney, who asked that a judgment of Mr. Justice Wright in favour of Lever Brothers and the Niger Co. be set aside.

Lever Brothers own nearly all the shares in the Niger Co., of which Mr. Bell and Mr. Snelling were formerly chairman and vice-chairman respectively. Lever Brothers sued Mr. Bell and Mr. Snelling, alleging that they had abused their trust by entering into private buying and selling transactions in cocoa, in which the Niger Co. dealt.

When the Niger Co. was amalgamated with the African and Eastern Trading Corporation, Mr. Bell was paid £30,000, and Mr. Snelling £20,000 as compensation for loss of office. Mr. Bell and Mr. Snelling denied the allegations, but agreed that they had made a profit of £1,360 in respect of certain dealings in cocoa. Judgment was given by Mr. Justice Wright that the £50,000 paid as compensation should be returned to Lever Brothers.

After Lord Justice Scrutton had given judgment, Mr. A. T. Miller, K.C. (for appellants), said they might appeal to the House of Lords, and he asked for a stay.

Lord Justice Scrutton said the court would grant three weeks for the purpose of considering the question of an appeal to the House of Lords. There would be a stay of execution for 21 days, and if a petition to the House of Lords was lodged within three weeks Mr. Bell must bring into court £30,000 and Mr. Snelling £20,000.

Solidol Chemical, Ltd.

IN the Chancery Division on Monday, Mr. Justice Maugham dismissed the petition of Lysol, Ltd., for the compulsory winding-up of Solidol Chemical Ltd.

Mr. Lionel Cohen, K.C., for petitioners, said they were creditors for £172 17s. 8d. under an order made by the Registrar of Trade Marks in South Africa, which he submitted was a valid foreign judgment.

Mr. Voisey, K.C., for Solidol Ltd., said the company had a surplus ten times larger than the amount of its liabilities. The petition was by trade rivals with the object of embarrassing competitors.

His Lordship dismissed the petition with costs.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID CHROMIC.—1s. per lb., less 2½% d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3¼d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised, 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included: £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¼d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—5½d. to 7½d. per lb. Crude 60's 1s. 4d. to 1s. 6d. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 1d. to 2s. 3d. per gall. B.P., 4s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 3d. to 2s. 5d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 10d. to 2s. Dark, 1s. 5d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 7½d. to 8½d. per gall.; Standard Motor, 1s. 3d. to 1s. 4d. per gall.; 90%, 1s. 4½d. to 1s. 5½d. per gall.; Pure, 1s. 7½d. to 1s. 8½d. per gall. (The above prices were operative from October 21 last).

TOLUOLE.—90%, 1s. 8d. to 1s. 10d. per gall. Pure, 1s. 9½d. to 2s. 1d. per gall.

XYLOL.—1s. 4½d. to 1s. 9d. per gall. Pure, 1s. 7½d. to 1s. 11d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6d. to 6⅜d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1¾d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 8¾d. per gall. Solvent, 90/160, 1s. 2½d. to 1s. 2¾d. per gall. Solvent, 95/160, 1s. 3½d. to 1s. 5d. per gall. Solvent 90/190, 11d. to 1s. 2d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £5 per ton. Whizzed, £4 to £5 per ton. Hot-pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8¼d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8¼d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 0d. per lb., in ton lots.

DICHLORANILINE.—2s. 5d. per lb.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—7½d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 4d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. to £8 per ton. Grey, £14 to £15 per ton. Liquor, 9d. per gall.

ACETONE.—£74 to £75 per ton.

CHARCOAL.—£6 5s. to £8 3s. per ton, according to grade and locality.

IRON LIQUOR.—10d. to 1s. 2d. per gall.

RED LIQUOR.—8d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—2s. 11d. to 3s. 1d. per gall. Solvent, 4s. per gall.

WOOD TAR.—£4 5s. per ton.

BROWN SUGAR OF LEAD.—£37 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£6 to £7 10s. per ton, according to quality.

CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—3¼d. to 4⅛d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity. drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4¼d. to 5½d. per lb.; Dark, 4½d. to 5d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 6d.–7s. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£38 5s. per ton, for ½ ton lots, £37 5s. for 1 ton, smaller quantities £39 5s., delivered, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 5d. to 1s. 5½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. to 1s. 0½d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 9d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.
ARGENT. NITRAS, CRYSTALS.—1s. 1d. per oz.
ATROPHINE SULPHATE.—8s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 9d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. to 1s. 6d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
EMETINE HYDROCHLORIDE.—58s. 6d. per oz.
EMETINE BISMUTH IODIDE.—33s. per oz.
EPHEDRINE, PURE.—12s. 6d. to 13s. 6d. per oz.
EPHEDRINE HYDROCHLORIDE.—9s. 9d. to 10s. 6d. per oz.
EPHEDRINE SULPHATE.—9s. 9d. to 10s. 6d. per oz.
ERGOSTEROL.—2s. 6d. per gm.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—27s. 6d. per oz.
HYDRASTINE HYDROCHLORIDE.—85s. per oz. for small quantities.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb., for 28-lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 3s. 3d. per lb. list price
IRON PERCHLORIDE.—18s. to 20s. per cwt. according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. 3d. per lb. net; Synthetic, 8s. 6d. to 10s. 6d. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. 3d. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
PILOCARPINE NITRATE.—10s. 6d. per oz.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—89s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 2d. to 3s. per lb.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
QUINOPHAN.—B.P.C., 14s. 6d. to 16s. 6d. per lb. for cwt. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—18s. 6d. per lb.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE.—B.P.C. 1911, 1s. 10d to 2s. 8d. per lb. B.P.C. 1923, and U.S.P., 2s. 2d. to 3s. per lb.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 7s. 3d. to 8s. per lb., according to quantity Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—9s. 6d. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—6s. 6d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—7s. 6d. per lb.
CITRAL.—7s. 6d. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—8s. 9d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—10s. 9d. per lb.
LINALOL, EX BOIS DE ROSE.—6s. per lb. Ex Shui Oil, 6s. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—8s. 6d. per lb. Ex Shui Oil, 8s. 6d. per lb.
MUSK KETONE.—30s. per lb.
MUSK XYLOL.—6s. 3d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—44s. per lb.

(*Essential Oils on page 490.*)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co. Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, November 20, 1930.

THE market has received quite a fair amount of business during the past week, with prices remaining on the whole unchanged. There is also a fair amount of inquiry for 1931 contracts. Export business has been about up to the level of previous weeks.

General Chemicals

ACETONE.—The market is firm at £71 10s. to £80 per ton, according to quantity, with a regular demand.

ACID ACETIC.—Quite considerable business is passing at £36 5s. to £38 5s. per ton for technical 80%, and £37 5s. to £39 5s. for pure 80%.

ACID CITRIC.—In a little better request, and price continues steady at 1s. 6¼d. per lb., less 5%.

ACID FORMIC.—Unchanged at £38 per ton for 85%, and there is a steady demand.

ACID LACTIC.—The market is receiving a fair amount of inquiry, the product being steadily quoted at £41 to £42 per ton for 50% by weight, pale quality.

ACID OXALIC.—Firm at £30 7s. 6d. to £32 per ton, according to quantity, and there is a regular demand.

ACID TARTARIC.—The market is very firm at about 1s. per lb., less 5%, with an increase in the demand.

ALUMINA SULPHATE.—Active at about £7 15s. to £8 5s. per ton, according to quantity.

ARSENIC.—Has been advanced, and is very firm at about £19 to £19 10s. per ton, with a heavy demand.

CREAM OF TARTAR.—Unchanged at 88s. per cwt., ex warehouse London, at which price the market is very firm, and is receiving quite a fair business.

COPPER SULPHATE.—Prices have sharply advanced and are firm at about £22 to £22 10s. per ton, free on rails London. Inquiry is improving.

FORMALDEHYDE.—In steady demand at about £32 per ton, ex wharf London.

LEAD ACETATE.—Unchanged at £35 15s. per ton for white and £34 15s. per ton for brown, with a fair demand.

LEAD NITRATE.—Continues unchanged at £29 10s. per ton.

LITHOPONE.—Steady at £19 to £22 per ton, according to grade and quantity, and there is quite a substantial demand.

CARBONATE OF POTASH.—Quoted at £28 to £29 per ton for 96/98% arsenic free quality, at which prices there is fair business passing.

PERMANGANATE OF POTASH, NEEDLE CRYSTALS, B.P.—In fairly active demand at 5½d. per lb.

SODIUM BICHROMATE.—Steady at 3⅜d. per lb., with discount for contracts, and a small business is passing.

SODIUM CHLORATE.—Much firmer at £25 per ton, with an increasing demand.

SODIUM HYPOSULPHITE.—Commercial Crystals unchanged at £8 10s. per ton, and photographic crystals at £14 5s. per ton, at which prices there is a steady trade passing.

SULPHIDE OF SODA.—£10 5s. to £11 5s. per ton for solid, with broken £1 per ton extra, both carriage paid, and in regular request.

TARTAR EMETIC.—Firm at about 11d. per lb.

ZINC SULPHATE.—Steady at £11 10s. to £12 per ton.

Coal Tar Products

There is little improvement to report in the Coal Tar Products market. Prices remain unchanged from last week, but inquiry from abroad is distinctly better.

MOTOR BENZOL.—Remains at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Unchanged at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Remains at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL.—Quoted at 3d. to 3½d. per gallon, f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Quoted at 1s. 8d. per gallon for the 98/100% quality, and at 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Unchanged, the firelighter quality being quoted at £3 10s. to £3 15s. per ton, the 74/76 quality at about £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.

PITCH.—Worth 37s. 6d. to 42s. 6d. per ton, f.o.b. East Coast port, with little demand for prompt delivery.

THE following additional prices have been received:—

Carbolic Acid.—A fair amount of business has been transacted during the past week, as a result of the new prices which came into operation on November 5, and the market can be considered as fairly steady.

Cresylic Acid 98/100.—Material is quoted to-day at 1s. 9d. to 1s. 11d. per gallon with purer qualities at anything from 2s. 3d. to 2s. 6d. per gallon.

Methyl Salicylate.—Unchanged at 1s. 3d. to 1s. 5d. per lb.

Salicylic Acid B.P.—1s. 5d. to 1s. 8d. per lb., Technical quality 1s. to 1s. 2d. per lb.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—*Export.*—The market for sulphate of ammonia continues quiet but producers are holding firm at £7 to £7 5s. per ton f.o.b. U.K. port in single bags. It is anticipated that the market will advance as the consuming season draws nearer. *Home.*—On account of the depressed condition of agriculture, interest in this product seems to be smaller than usual. It is anticipated that our Irish demands will show an advance on last year but in Great Britain a fall in the consumption is expected unless prospects improve within the next few months.

NITRATE OF SODA.—Producers are still offering at fixed prices to various markets but no large sales have been reported recently. Heavy stocks in consuming countries tend to cause buyers to hold off until nearer the consuming season.

Latest Oil Prices

LONDON, November 19.—LINSEED OIL closed steady at 10s. to 2s. 6d. per ton advance. Spot, £27; November, £23 15s.; December, £23; January to April, £21 2s. 6d.; May to August, £20 2s. 6d.; and September to December, £20 15s., naked. RAPE OIL was quiet. Crude extracted, £29 10s.; technical refined, £31, naked, ex wharf. COTTON OIL was quiet. Crude, £23 10s.; refined common edible, £28 10s.; and deodorised, £30 10s., naked, ex mill. TURPENTINE was firm and 6d. per cwt. higher. American spot, 35s. 6d.; December, 35s. 9d.; January to April, 36s. 9d.; Russian, spot, 33s.

HULL.—LINSEED OIL, naked, closed for spot at £25 5s.; November, £24 15s.; December, £23; January to April, £21 7s. 6d.; May to August, £20 12s. 6d.; East Indian, spot, £27 5s.; Baltic, spot, £28 5s. COTTON OIL.—Naked, Egyptian, crude, spot, £22; edible refined, spot, £25 5s.; technical, spot, £25; deodorised, spot, £27 5s. PALM KERNEL OIL.—Crude, naked, 5½ per cent., spot, £25. GROUNDNUT.—Crushed/extracted, spot, £28 10s.; deodorised, spot, £32 10s. SOYA OIL.—Extracted and crushed, spot, £25; deodorised, spot, £28 10s. RAPE OIL.—Crushed/extracted, spot, £29; refined, spot, £31 per ton. TURPENTINE, spot, 37s. 6d. per cwt. CASTOR and COD unchanged. Net cash terms, ex mill.

Scottish Coal Tar Products

ORDERS continue scarce and in most cases stocks are uncomfortably high. The further drop in value of cresylic acid has tempted some consumers to place orders for delivery to the end of the year, but there remains a lack of confidence in the market generally.

Cresylic Acid.—There are few large orders being placed. Pale, 99/100%, 1s. 7¼d. to 1s. 8¼d. per gallon; pale, 97/99%, 1s. 6¼d. to 1s. 7¼d. per gallon; dark, 97/99%, 1s. 5¼d. to 1s. 6¼d. per gallon; high boiling, 1s. 7d. to 1s. 9d. per gallon; all in bulk f.o.r. works.

Carbolic Sixties.—Value is nominal at about 1s. 10d. to 2s. per gallon for good grades.

Creosote Oil.—A fair demand continues for gas works oil but other grades are dull. Specification oil, 2¾d. to 3d. per gallon; gas works ordinary, 3¼d. to 3¾d. per gallon; washed oil, 3d. to 3½d. per gallon; all f.o.r. works.

Coal Tar Pitch.—Export orders are very scarce. Quotations have been reduced to about 42s. 6d. to 45s. per ton f.a.s. Glasgow. Home trade is dull with value about 45s. per ton, ex works.

Blast Furnace Pitch.—Quiet at controlled prices of 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Attention has been focused on this product for forward delivery but orders remain scarce. Value is easy at 3d. to 3¼d. per gallon, ex works.

Blast Furnace Tar.—Without interest at 2¾d. per gallon.

Crude Naphtha.—Prices are steady at 4d. to 4¼d. per gallon, f.o.r. in bulk.

Water White Products.—Stocks are accumulating and quotations are easy. Motor Benzole, 1s. 4d. to 1s. 4½d. per gallon; 90/160 solvent, 1s. 2d. to 1s. 3d. per gallon; 90/190 heavy solvent; 1s. to 1s. 0½d. per gallon; all in bulk quantities f.o.r. makers' works.

South Wales By-Products

SOUTH WALES by-product activities remain practically unchanged. Pitch continues to have a slow market, patent fuel makers and other big users buying only for immediate requirements. Stocks are consequently well in excess of demand.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, November 18, 1930.

THE Scottish heavy chemical market has shown considerable improvement in home and export business during the past week.

Industrial Chemicals

ACETONE.—B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum 1-ton lots.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered free Great Britain in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads

ACID, OXALIC.—98/100%.—On offer at the same price, viz.: 3½d. per lb., ex store. On offer from the Continent at 3½d. per lb., ex wharf.

ACID, SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11½d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £28 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £19 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £20 5s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £10 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or at £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £33 per ton, ex store. Continental on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, carriage paid.

LEAD, ACETATE.—White crystals quoted round about £38 to £39 per ton ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE.—GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £25 per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb, ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid, buyer's station, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £9 12s. per ton, carriage paid, buyer's sidings, minimum six-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices, 55s. per ton, ex works; 57s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

(*Continued from page* 488.)

Prices of Essential Oils

BERGAMOT OIL.—8s. 9d. per lb.

BOURBON GERANIUM OIL.—17s. per lb.

CINNAMON OIL LEAF.—6s. 3d. per oz.

CLOVE OIL, 90/92%.—8s. 3d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. 9d. per lb.

LEMON OIL.—4s. 6d. per lb.

PEPPERMINT OIL.—Wayne County, 10s. per lb.

The Fate of the Dyestuffs Act

Protest Against Government Indecision

THE Association of British Chemical Manufacturers, on Monday, issued the following statement:—

"At their meeting last week the Council of the Association of British Chemical Manufacturers passed the following resolution directing attention to the extraordinarily difficult situation in which the dyestuffs industry of this country is placed through the failure of the Government to make any pronouncement on their policy concerning the Dyestuffs (Import Regulation) Act, due to expire on 15th January, 1931:—

"'That the Council of the A.B.C.M. views with regret the delay on the part of His Majesty's Government in announcing their policy with reference to the continuance or otherwise of the Dyestuffs Act. The Council desires to point out that only eight weeks remain before the expiration of the Act, and if it be not renewed, this time is quite insufficient for British dyemakers to make arrangements to meet the adverse circumstances in which the industry will have to be conducted.'

"The dyemaking industry, born originally in this country, but allowed by apathetic British policy to become virtually a monopoly of Germany, has now been re-established to such an extent that no less than 93 per cent. of the British requirements of dyestuffs are being made here, as compared with less than 20 per cent. pre-war. This enormous progress, which has not only benefited the dyemakers and dye users, but which is a great national asset, has been rendered possible by the regulation of imports of foreign dyestuffs under the Dyestuffs Act. An immediate declaration of the Government's intentions in respect of the Act would appear to be urgently called for."

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, November 20, 1930.

Values on the chemical market here during the past week has been remarkably steady taking them on the whole, with few instances, indeed, of anything resembling fresh weakness. Contrary to recent hopes, there has not up to the present been any marked expansion in the demand for heavy chemicals in the dyeing and finishing and allied industries, although deliveries to these branches against existing commitments keep up fairly well. Without at the moment doing much in the way of forward buying, a moderate volume of business is being placed for near delivery positions.

Heavy Chemicals

No more than a quiet demand is about at the moment in the case of phosphate of soda though values of the dibasic material keep up at round £10 per ton. Prussiate of soda is a firm section at from 4¾d. to 5¼d. per lb., according to quantity, and a fair amount of buying interest is being shown. No more than a moderate inquiry is reported in respect of sulphide of sodium, without, however, any change in the price position; the 60-65 per cent. concentrated solid quality is on offer at about £9 per ton, and the commercial material at £8. Chlorate of soda is in relatively quiet request, with supplies obtainable at down to £23 per ton. Bicarbonate of soda remains very firm at about £10 10s. per ton in contract parcels, and a fair amount of business is being done. Caustic soda moves off in fairly steady quantities and contract prices are held at from £12 15s. to £14 per ton, according to grade. Not a great deal of interest has been shown this week in the case of salt cake, offers of which range from £2 15s. to £3 per ton. Hyposulphite of soda is steady with the demand on moderate lines; the commercial quality is quoted to-day at about £9 5s. per ton, and the photographic at £15. A quietly steady business is going through in alkali at round £6 per ton. Bichromate of soda is unchanged at 3¾d. per lb., less 1 to 3½ per cent., a moderate enquiry being reported.

Values of yellow prussiate of potash keep up at the range of 6¾d. to 7¼d. per lb., according to quantity, a quiet demand being met with during the past week. Carbonate of potash seems to have settled down for the time being at between £24 10s. and £25 per ton, sales being of moderate extent. Permanganate of potash is moving off slowly, but there has been no alteration in the price position, B.P. grade being on offer at about 5½d. per lb., and the commercial at 5¼d. Quotations for chlorate of potash keep up in the region of £25 per ton, a quietly steady demand being met with. There is a moderate call for bichromate of potash and values remain on the basis of 4⅛d. per lb., less 1 to 3½ per cent. Fair sales of caustic potash are being made at about £28 10s. per ton.

Arsenic keeps firm on comparative scarcity, values ranging from about £18 10s. to £19 per ton at the mines, for white powdered, Cornish makes. Sulphate of copper is in much the same position as of late, offers being at round £21 per ton, f.o.b. No more than a quiet trade is being done in acetate of lime, with the brown quality quoted at about £7 10s. per ton and the grey at from £14 to £14 10s. Moderate interest is being displayed in the lead products, with nitrate on offer at from £29 to £29 10s. per ton, and acetate at £35 for white and £34 10s. for brown.

Acids and Tar Products

Oxalic acid is steady at £1 12s. per cwt., ex store, but the demand for this material is rather inactive. Tartaric acid maintains its renewed firmness, current values ranging from 1s. 0½d. to 1s. 1d. per lb. Citric acid is in quiet request with offers at round 1s. 5½d. per lb. With regard to acetic acid, there is a moderate demand about and quotations keep up at round £37 per ton for the 80 per cent. commercial grade, and from £47 to £51 per ton for the glacial.

There has been little alteration during the past week in the price position of the by-products. Pitch is nominally steady at from 45s. to 47s. 6d. per ton, f.o.b., with creosote oil moving in moderate quantities at from 4d. to 4½d. per gallon, naked, at works. Not much buying interest is being shown in the carbolic acid section, crude 60's being at about 1s. 8d. per gallon, naked, and crystals at from 5½d. to 6¼d. per lb., f.o.b. Solvent naphtha is steady at up to 1s. 3d. per gallon, naked, and a moderate demand is reported.

Company News

John Knight, Ltd.—An interim dividend of 10 per cent., less tax, is announced on the ordinary shares.

Lautaro Nitrate Co.—The general meeting of the company will be held at Calle Serrano, 546, Valparaiso, Chile, on December 16.

Shawinigan Water and Power Co.—A dividend on the common shares of $8\frac{8}{8}$ per share is payable for the quarter ended December 31, 1930.

A. B. Fleming and Co., Ltd.—The directors have declared an interim dividend in respect of the year ended April 30, 1931, of 5 per cent. actual, less income tax, payable on November 21.

Broken Hill Proprietary, Block 14.—Operations for the six months ended September 30 last have, it is announced, resulted in a loss of £3,171, against a net loss of £7,478 on the previous half-year.

Timothy Whites (1928), Ltd.—Total profits for the year to July 31 last amounted to £155,321, against a comparable figure of £163,640, and of the decline it is stated that £6,072 is accounted for by depreciation of Stock Exchange securities.

Langdale's Chemical Manure Co.—A profit of £765 is reported for the year ended September 30, 1930. After deducting this amount from the debit balance of £3,203 brought forward, there remains a loss of £2,438 to be carried to the next account.

Zinc Corporation, Ltd.—Dividends have been declared by the directors, of 2s. per share on the preference shares, being the fixed rate for the six months ending December 31, 1930, and of 9d. per share on both the preference and ordinary shares, being the participating dividend for the year ending December 31, 1930. These payments will be made on January 2, 1931.

Weardale Lead Co.—The report for the year ended September 30, 1930, states that there was a profit, including income from investments, of £4,380. After writing down property, plant and machinery by £3,637, the amount to be dealt with, including the balance brought forward, is £6,874. Out of this an interim dividend of 6d. per share has been paid, amounting to £2,448, leaving £4,426, which the directors propose to carry forward.

Big Rise in German Glue Exports

German glue exports show a remarkable increase, the 1929 total being nearly double those of the preceding year. Exports to the United Kingdom, which have shown a pronounced decline in 1927 and 1928, again jumped forward, while the exports to the United States were almost quadrupled during the year. The figures for the past four years (in metric tons) are:

Destination	1926	1927	1928	1929
United States	757	586	604	2,277
United Kingdom	1,556	866	617	1,183
France	583	181	311	518
Switzerland	297	256	368	421
Belgium	431	337	239	420
Argentina	151	147	249	417
Japan	—	172	—	303
China	154	—	—	366
Other countries	1,696	1,783	1,824	2,347
Total quantity	5,625	4,331	4,212	8,352

Kelp Burning in Ireland

At the annual general meeting of the Pharmaceutical Society of Ireland a lecture on "Kelp" was delivered by Mr. G. C. Hewson, who is an analyst of the Irish Free State Department of Land and Fisheries. Among the many uses to which the seaweeds of the West Coast could be put, he said, was the manufacture of paper, as a fertiliser, and in the making of sizes and glues. The kelp rods, when gathered, are air dried and then formed into loose bundles before being burnt for conversion. Discussing the production of iodine from the kelp, Mr. Hewson said, "Although iodine manufacture in this country is, as yet, in its infancy, I think we may well be optimistic about future developments, and one day shall be able to congratulate ourselves on the successful commercial exploitation of another of our natural resources."

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to December 5, 1930.

DURATOL.

516,278. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures, not included in other classes. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester; manufacturers. September 23, 1930. To be Associated with No. 381,992 (2,099) and others.

NERAN.

516,534. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures not included in other Classes. British Dyestuffs Corporation, Ltd. October 2, 1930. To be Associated with No. 516,533 (2,745) i.

NERAN.

516,533. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester; manufacturers. October 2, 1930. To be Associated with No. 516,534 (2,745) iv.

DIGIDEX.

515,020. Class 3. Chemical substances prepared for use in medicine and pharmacy. The British Drug Houses, Ltd., 16 to 30, Graham Street, City Road, London; wholesale druggists. August 1, 1930. To be ?

CARDICE.

516,211. Class 1. Carbon dioxide in solidified form, for use as a refrigerant. The Carbon Dioxide Co., Ltd., Union Marine Buildings, 11, Dale Street, Liverpool; manufacturers. September 19, 1930. To be Associated with No. 515,214 (2,740).

Opposition to the Registration of the following Trade Marks can be lodged up to December 12, 1930.

D-ZOL.

515,850. Class 1. Compounds for removing and preventing scale in steam boilers, liquid heaters and other similar liquid containers. W. and F. Walker, Ltd., Colonial House, Water Street, Liverpool; manufacturers.—September 5, 1930.

MIGASOL.

516,850. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Society of Chemical Industry in Basle (a joint stock company organised under the laws of Switzerland), 141 to 227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants.—October 13, 1930.

CADOX.

516,869. Class 1. Wood preservatives. E. Wade Wilton and Son, Planet Works, Hill Top, Bramley, Leeds; analytical and manufacturing chemists and chemical engineers.—October 14, 1930.

KEMET.

516,161. Class 3. Chemical substances prepared for use in medicine and pharmacy. The Chemical and Metallurgical Corporation, Ltd., 701, Salisbury House, London Wall, London, E.C.2; manufacturers.—September 18, 1930. To be Associated with No. 489,899 (2620) ii and another.

French Sodium Silicate Production

SODIUM silicate production in France is estimated at 40,000 to 50,000 tons annually, reports the U.S. Assistant Trade Commissioner in Paris. It is used principally on roads and for the manufacture of soap. Imports are very small, having averaged about 200 tons in 1928 and 1929. Exports have increased considerably, and in 1928 reached 4,548 tons. In 1929 the exports were 2,945 tons of anhydrous sodium silicate and 1,917 tons in solution.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette, &c.

Companies Winding Up Voluntarily

MIDLAND ROUMANIAN OIL, LTD. (C.W.U.V., 22/11/30.) By special resolution, November 14. D. Neal, 110, Edmund Street, Birmingham, chartered accountant, appointed as liquidator.

POPIELE OIL CO., LTD. (C.W.U.V., 22/11/30.) By special resolution, November 14. D. Neal, 110, Edmund Street, Birmingham, chartered accountant, appointed as liquidator.

New Companies Registered

GOODLASS WALL AND LEAD INDUSTRIES, LTD., London House, 3, New London Street, London, Registered as a "public" company on November 12. Nominal capital, £2,250,000 in 1,500,000 7 per cent. cumulative preference shares of £1 each, 1,000,000 7 per cent. preferred ordinary shares of 10s. each, and 2,500,000 ordinary shares of 10s. each. To acquire and amalgamate the undertakings of Goodlass, Wall and Co., Ltd., and Associated Lead Manufacturers, Ltd., pursuant to a scheme sanctioned by the Court on October 31, and to carry on the business of manufacturers of and dealers in refined pig lead, dry white lead, white lead in oil, white lead paint, red and orange lead, antimonial lead, copper slags, litharge, lead sheets and pipes, etc. Directors: A. P. Bevan, J. Byrne, C. Cookson, Col. A. J. Foster, A. W. Gibson, Rt. Hon. Lord Inverforth, Sir John Mann, C. A. Rowe, C. F. Spencer, H. S. Tasker.

E. YOUNG (BRISTOL), LTD. Registered November 14. Nominal capital, £1,000 in £1 shares. Consulting, analytical, manufacturing, pharmaceutical and general chemists, etc. Directors: W. H. D. Season, 5, Lilymead Avenue, Knowle, Bristol; V. O. Season, D. M. Joiner.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

HOLLAND.—The Director of the Government Medical Stores of Amsterdam is calling for tenders, to be presented in Amsterdam by December 2, for the supply of medical supplies for the Department of Defence in the Netherlands and the Service in the Netherlands East Indies. (Ref. No. B.X. 6,869.)

A civil engineer at The Hague, well introduced in Government and municipal works and in the engineering trade generally wishes to secure the representation of manufacturers of oil, gas or electric furnaces and apparatus for chemical factories and gasworks. (Ref. No. 454.)

NEW ZEALAND.—A firm of agents desires to represent British firms handling paint and varnishes and grease-proof paper. (Ref. No. 448.)

Tariff Changes

CHILE.—The Chilean Society of Manufacturers have drawn up a list of goods (over 500 in number) which, it is considered, can be manufactured in Chile in sufficient quanrity and quality to meet the needs of the country, and it is understood that a Decree will shortly be issued to increase the import duties on the great majority of these goods by 35 per cent., 60 days' notice to be given of the increase. Among the goods included in the list are linseed and edible oils, soap, candles, chemicals, explosives, waxes, paints, starch and various kinds of paper.

ROUMANIA.—Certificates of origin are required for the import of glue and must indicate the name of the factory where the glue is manufactured.